

Consumers' Research

BULLETIN

JULY • 1955

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Consumers' Research functions to provide unbiased information on goods bought by ultimate consumers. For their benefit (not for business or industry) and solely with the funds they provide, CR carries on tests and research on a wide variety of goods, materials, and appliances, and publishes the findings in CR BULLETIN. Consumers' Research is a non-profit institution, and is organized and operates as a scientific, technical, and educational organization.

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OFF THE EDITOR'S CHEST

THE practice of issuing unconditional guarantees and "satisfaction or your money back" guarantees which have not always been carried out promptly and satisfactorily even by large and well-established companies in certain cases has been severely criticized by CR, Better Business Bureaus, and others. We are glad, however, to have an opportunity to cite a guarantee that seems to be backed up as completely as any consumer could wish. It is given by the Zippo Manufacturing Company in behalf of their cigarette lighter with the promise that if *anything* goes wrong with the lighter, Zippo stands ready and willing to repair it free of charge.

An interesting example of the company's fulfillment of the guarantee furnished with its lighters recently came to our attention. One of the early models, purchased about 1938, received unusually hard service up to and during the war years. When its owner left the military service in 1946, the hinge of the cover was worn and the cover did not stay closed. The lighter was mailed to the company, and when it was returned, repairs, free of charge, had included replacement of the following parts: cover hinge, brace, spring, cotton, wick, spark wheel, plus a complete cleaning; a few extra pieces of the "flint" were also furnished. The company even paid return postage.

This particular lighter performed satisfactorily from 1946 until early 1955, in constant service. When a spring failed, the lighter was again returned to the manufacturer, and within 10 days it was back, in perfect operating condition with no charge whatever.

This dependable guarantee by the Zippo Manufacturing Company is one that we are glad to commend as an achievement in consumer service, especially since many product guarantees have proved to have a "catch" in them, so that the promised service was not supplied. This lighter manufacturer establishes a yardstick by which other guarantees may be evaluated.

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It will be advantageous if you will, whenever possible, send prompt notice of change of address at least 5 weeks before it is to take effect, accompanying your notice with statement of your old address with name in full. At least a month's notice must be given in any case. *This rule, however, regarding long advance notice does not apply to military personnel. CR will, of course, gladly change addresses for men and women in the services as often as required by changes in station and other circumstances.

Symbols used to indicate sources of data and bases of ratings: AA—regarded as worthy of highest recommendation; A—recommended on basis of quality; B—intermediate with respect to quality; C—not recommended on basis of quality; CR—information from Consumers' Research's own tests or investigations; 1, 2, 3—relative prices, 1 being low, 3 high. Note that price and quality are completely differentiated in CR's listings; a quality judgment is independent of price; 54, 55—year in which test was made or information obtained or organized by the staff of Consumers' Research.

The Consumers' Observation Post

COURTESY is what shoppers most desire from department store personnel. According to a study of consumer opinion made by a large New York advertising agency, nearly half of the people queried mentioned courtesy first, with efficiency second. No doubt politeness in showing merchandise and handling sales transactions are important factors to the prospective purchaser, followed by speed and efficiency in winding up the transaction after a decision is made. Anyone who has waited a considerable length of time for change and having a parcel wrapped will appreciate the importance of this last item in creating or losing good will.

* * *

TOILET SOAP is likely to be featured extensively for its claimed ability to remove germs and odor-forming bacteria from the skin in future advertising. The success of Dial soap which contains the bacteriostat hexachlorophene, trade-marked G-11 and AT-7, is stirring the interests of other soap companies. According to Chemical Week, Colgate is currently test marketing a new form of Palmolive fortified with bithionol (chemical name 2,2'-thiobis (4,6-dichlorophenol)) and Lifebuoy is already on the market with its new deodorant Puralin or TMTD (chemical name, tetramethyl thiuram disulfide). The magazine makes an interesting observation about Lifebuoy, that Lever has tried to take it "out of the locker room classification" by adding "Puralin," pointing out that the change first produced just a newly scented soap with no bacteriostat. Then when TMTD was added the trade name "Puralin" was transferred to the antiseptic additive, an example of how a "magic" ingredient changes its character to suit the requirements of an advertising campaign.

* * *

HIGH FIDELITY ENTHUSIASTS COMPLAIN REPEATEDLY about the careless manufacture and merchandising of LP records. One writer to the editor of High Fidelity Magazine reports that, in his opinion, most records on dealers' shelves in New York City are scratched and marked to begin with. It is his experience that only one record out of six is free from serious defects, and he finds it difficult to select a record free from repeating clicks, pops, and hisses.

* * *

BEEES, HORNETS, AND WASPS in farm and country homes and gardens are not merely a painful nuisance; they can be a positive menace to the driver of an automobile and to those who have a sensitivity to insect stings. A dramatic account of such difficulties in Science Service reports the case of a little boy, stung by a wasp, who turned blue and seemed to have stopped breathing, with no heartbeat or pulse that could be felt. The doctor, diagnosing the reaction as an allergy, injected antihistamines, but this treatment was ineffective until it was supplemented by an injection of calcium lactate solution. Two injections of calcium lactate were required before the lad recovered. The doctor (D. G. Miller, Jr., Morgantown, Ky.) described the reaction as anaphylactic shock and recommended that doctors keep calcium lactate in their bags and offices ready for emergency use in such cases.

* * *

DANGERS FROM RADIOACTIVE FALL-OUT following nuclear explosions is a topic of earnest discussion in scientific circles. According to Dr. Gordon M. Dunning of the A. E. C.'s Division of Biology and Medicine, the average exposure to people in the United States from all atomic and thermonuclear tests to date has been about 1/10 of a roentgen. This is estimated, according to an account in the N. Y. Herald Tribune, at about the equivalent

of a dose of radioactivity delivered to a human chest from a clinical X-ray taken to search for traces of tuberculosis or some other chest disorder.

* * *

THE FLAVOR IMPROVER monosodium glutamate is finding its way into a considerable number of frozen foods. Recent studies have brought to light the fact that it improves the flavor of frozen vegetables, sea foods, meats and poultry, and also assures better retention of flavor after many months of storage. Fish fillets, codfish cakes, clam chowder, beef stew, and chicken-a-la-king when treated with MSG all showed increased palatability after storage for 12 months over similar products that were untreated. (The cost of the treatment ran from 2/10c to 4/10c per pound of food.) Consumers, however, who have discovered that they have an allergy to this substance will need to read the labels of frozen foods carefully before making their purchases or be obliged to limit their purchases to fresh food products. They will rightly question the use of a flavor reinforcer to offset loss of flavor that deteriorates with long storage.

* * *

THE EYECUP should be considered in the same class as the family toothbrush, a menace to health. That is the considered opinion of Dr. T. G. Cogswell, writing in the New Hampshire Health News. Dr. Cogswell points out that an eyecup should be boiled and sterilized before it is used. Otherwise it can serve as a transfer medium for infection from one eye to the other. He further points out that tears contain an enzyme called "lysozyme" which is its own excellent antiseptic against most bacteria found in the eyes. Diluting or disrupting the natural flow of tears by eyewashes with an eyecup only tends to lower resistance to infection.

* * *

SAFETY PINS are an important item in households where there is a newly arrived baby. Last March when brief mention was made of diaper pins in a report on diapers, we received an interesting analysis of current models from the manufacturer of a brand called Baby-Safe Safety Pin. According to this source of information, safety pins are made of three materials, stainless steel, brass, and carbon steel. Stainless-steel pins are non-corrosive; have sufficient spring tension and rigidity so that a smaller diameter of wire may be used, insuring easier penetration of the diaper fabric. Brass safety pins are rustproof and the leading brands are heavily nickel plated for corrosion resistance. Carbon steel is not rustproof and, even if a finish is applied to create rust resistance, the product will be somewhat unsatisfactory as a diaper pin. Stainless-steel pins, according to our informant, are put out under the brand names of Baby-Safe Safety Pin, Protecto, Reddy Safety Pins, Damascus, and some others.

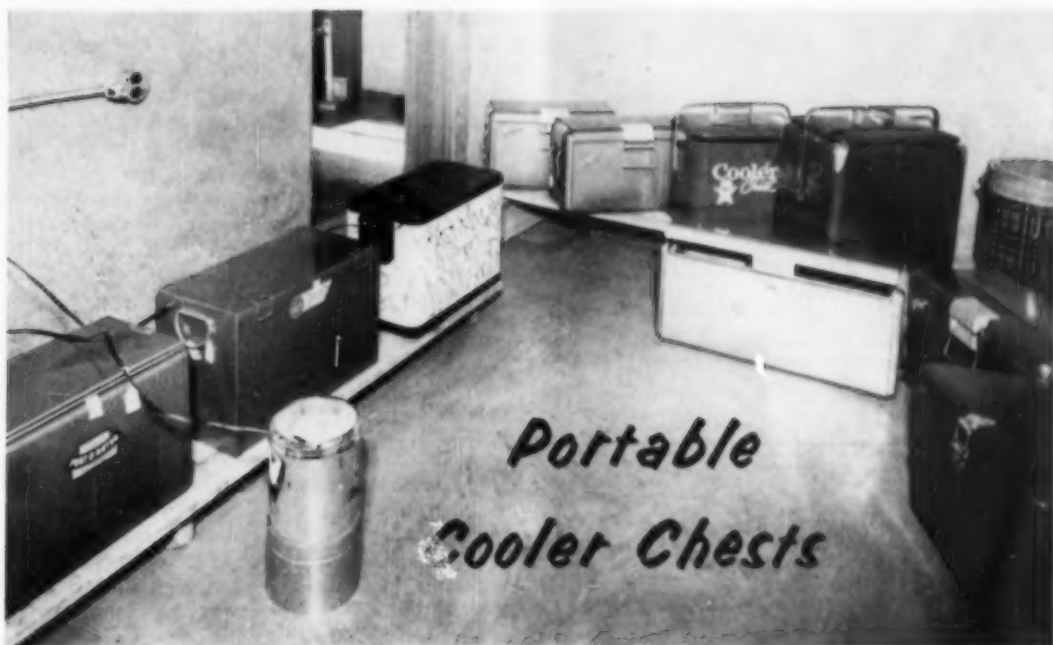
* * *

THE SUNBURN SEASON IS HERE, and certain common-sense precautions will be observed by those who know the dangers both to the appearance of the skin and to health from overexposure. Some good advice has been issued by Mrs. Veronica L. Conley, Secretary of the Committee on Cosmetics of the American Medical Association, who warns against relying too heavily on sun-tan lotions. These preparations need to be applied every two hours, and reapplied after coming out of the water. She recommends exposure to the sun in brief periods, no more than 10 minutes at first, and with gradual increases thereafter. It is important to protect the eyes from the burning rays of the sun by wearing dark glasses and, when lying down, covering the eyes with cotton pads. Protecting the hair from the sun's rays will prevent discoloration and brittleness. Lubricating the skin with a cream or lotion will help prevent excessive drying effects of the sun. Mrs. Conley also points out that, aside from preventing rickets in children, the benefits of repeated sunning are not well defined.

* * *

BROILER ROTISSERIES are being featured by department stores at heavily cut prices in an effort to take customers away from discount houses. The manufacturers of Broil-Quick and Roto Broil units are increasing their co-

(The continuation of this section is on page 33)



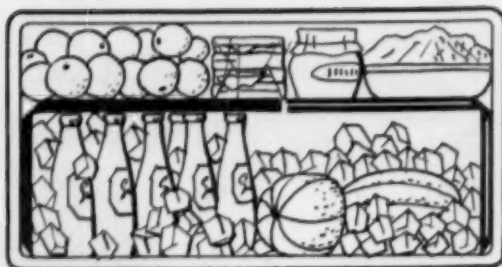
Portable Cooler Chests

THE owners of air-conditioned cars can now purchase a small mechanical refrigerator which sits on the front floor of the car to carry their cold drinks and food on trips. Because of their high price and the fact that such refrigerators would usually receive only limited and occasional use, most of us will be content with a relatively inexpensive portable ice chest for this purpose.

These small insulated boxes which are called by various names, such as Picnic Ice Boxes, Portable Chests, Portable Refrigerators, etc., are extremely popular among sportsmen, campers, and for picnics at the beach and elsewhere. They come in various sizes and prices (those tested by CR ranged in price from \$7.95 to \$19). Manufacturers make various claims, such as "Up to 5 days refrigeration from one filling of ice"; "Ice lasts 120 hours, maintaining an average temperature of 37-45°"; "Retains 90% efficiency after 24 hrs. when fully packed with ice"; "...insulation keeps food the way you packed it— piping hot! or icy cold"; "Tests prove 18 12-oz bottles will stay cold in the . . . up to 36 hours—even in the hottest weather." Such claims are pretty close to meaningless, from the consumer's standpoint, for the duration of refrigeration will depend upon (1) the outside temperature, and (2) the amount of ice used,

and the larger this amount the smaller the capacity for the storage of food will be. To be more specific, the box that was claimed to maintain an average of 37° to 45° with the ice lasting 120 hours was found under test conditions to give a temperature of 44°, six hours after being loaded with food and ice, and a temperature of 72° at the end of 24 hours (this with an outside temperature of 90°). The claim made for another box about retaining "90% efficiency after 24 hrs. when fully packed with ice" would mean nothing in particular to a layman, who might interpret this to mean that after 24 hours the temperature inside the box would increase only 10 percent. That would be pointless, since if the refrigerator were fully packed with ice, there would be no room for storage of food and beverages.

For maximum utility, a box should be equipped with means for providing both dry and wet storage. For example, bottled drinks, salads in waterproof containers, etc., should be stored in contact with the cracked ice while sandwiches, fruits, and other foods that should be kept dry must be kept out of contact with the ice and the water from melted ice. There are several methods used for doing this. The simplest is probably a tray for dry storage located at the top of the box. The only disadvantage of such a



method is that the amount of dry storage is limited by the size of the tray. Another method is to have a separate closed container for the ice. A third method, which seems to be the best, is the adjustable tray. The ways in which a tray of this type can be used are shown at the left. A device of this sort, used by *J. C. Higgins* (6—07412) and *Kampkold*, gives the user the opportunity to use a maximum amount of ice for the quantity of food to be carried.

CR's tests

As the most important characteristic of an ice chest is its ability to keep its contents as cold as possible, certainly not above 50 to 55°, for a reasonably long period, this feature was given the most weight. Other considerations were convenience, appearance, and probable durability. The boxes varied in size as did the amount of ice recommended by the manufacturers. Thus, in order to obtain results which would be comparable, an amount of cracked ice equal to 25 percent of the total volume of each box was used as the cooling medium. Tests were made under both "no-load" and food storage conditions. In the food storage test, which was used as a principal basis for the ratings, a load representing food precooled to 38°F in an amount equivalent to 25 percent of the total capacity of each box was used. Thus, each box had 25 percent of its total volume assigned to cracked ice, 25 percent to food, and 50 percent to air. Tests were made in a room in which the temperature was controlled at 90°F. The empty boxes were placed in the room for 24 hours before the tests were made.

Price ratings are on a per-cubic-foot basis.

A. Recommended

J. C. Higgins (Sears-Roebuck's Cat. No. 6—07412)

\$14.50, plus postage.

Description: Exterior, steel with 2-tone baked-enamel finish. Sponge-rubber gasket on both lid and box. Size, 23 in. long x 14 in. wide x 13 in. deep. Interior, galvanized steel. Volume, 1.4 cu. ft. *Fiberglass* insulation. Telescopic galvanized tray adjustable to 5 positions for dry and wet storage (e.g., sandwiches, beverage bottles). Two plated-steel carrying handles with rubber grips, one at each end. Drain plug with plastic retainer. Built-in bottle opener. Weight empty, 23 lb. 7 oz.

Performance in test: Cold-retaining ability, above average. Maintained temperatures below 50° for 19 hr., instead of 72 as claimed in advertising. A large well-made box, with an adjustable tray which is considered a very desirable feature. **1**

Cooler Chest (Reiber Cooler Co., Inc., Indianapolis 5) \$12.95.

Description: Exterior, steel with baked-enamel finish. Size, 16½ in. x 12 in. x 16½ in. Rubber gasket on chest. Interior, galvanized steel. Volume, 1.0 cu. ft. *Fiberglass* insulation. Galvanized tray, 12½ in. x 10 in. x 2¼ in. Bail-type steel handle, drain plug, and built-in bottle opener. Weight empty, 12 lb. 14 oz.

Performance in test: Cold-retaining ability, above average. Maintained temperatures below 50° for 18 hr. **2**

Western Field (Montgomery Ward's Cat. No. 60—9591M; manufactured by Cronstroms Mfg. Co., Minneapolis) \$18.95, plus postage.

Description: Exterior, aluminum. Size, 23 in. long x 13 in. wide x 16 in. deep. Hollow rubber gasket on lid. Interior, aluminum with varnished maple strips at top against which gasket seals. Volume, 1.6 cu. ft. Fiber-glass insulation. Aluminum L-shaped separator. Two plated-steel carrying handles, one at each end. Drain plug with chain retainer. Built-in bottle openers. Weight empty, 17 lb. 4 oz.

Performance in test: Cold-retaining ability, very good. Maintained temperatures below 50° for 25 hr. (easily the best box tested). A well-made box of attractive appearance, but soft aluminum exterior was susceptible to damage. **2**

B. Intermediate

J. C. Higgins (Sears-Roebuck's Cat. No. 6—07411)

\$10.95, plus postage. ¶Also marked *Thermaster*, Poloron Products, Inc.

Description: Exterior, steel with baked-enamel finish. Single sponge-rubber gasket on lid. Size, 22½ in. x 12½ in. x 11 in. Interior, galvanized steel. Volume, 0.8 cu. ft. *Fiberglass* insulation. L-shaped ice separator of galvanized steel. Two plated-steel carrying handles, one at each end. Drain plug. Weight empty, 16 lb. 1 oz.

Performance in test: Cold-retaining ability, about average. Maintained temperatures below 50° for 10 hr. A well-made box except for aluminum trim, which had objectionably sharp corners. **2**

Kampkold, Model 1K-2S (American Gas Machine Co., Div. Queen Stove Works, Inc., Albert Lea, Minn.) \$14.95.

Description: Exterior, steel with 2-tone finish. Size, 23 in. long x 10½ in. wide x 14 in. deep. Thick sponge-rubber gasket on lid. Interior, aluminum. Volume, 1.1 cu. ft. Fiber-glass insulation. Hinged aluminum tray adjustable to 5 positions for dry and wet storage. Combination handles and lid locks at each end. Recessed drain plug, and built-in bottle openers. Weight empty, 19 lb. 1 oz.

Performance in test: Cold-retaining ability, about average. Maintained temperatures below 50° for 13 hr. A very well made box of good refrigerating capacity, but claim "up to 72 hrs. of refrigeration from one filling of ice" considered misleading. Adjustable tray and recessed drain plug in bottom of box judged very desirable. **2**



View of one of the cooler boxes with resistance thermometer being inserted for the measurement of temperature rise in the stored food as the ice melts.

Western Field (Montgomery Ward's Cat. No. 60—9539M) \$9.95, plus postage. ¶Identical to J. C. Higgins Cat. No. 6—07411. **2**

Cronco Port-o-Rator, Model 12-I.H. (Cronstroms Mfg. Co., Minneapolis 6) \$14.95.

Description: Exterior, steel with baked-enamel finish. Single sponge-rubber gasket on lid. Size, 20½ in. x 10 in. x 12½ in. Interior, aluminum. Volume, 0.9 cu. ft. Glass Fibre insulation. Two plated-steel carrying handles, one at each end. Drain plug with chain retainer. L-shaped ice separator and built-in bottle openers. Weight empty, 12 lb. 8 oz.

Performance in test: Cold-retaining ability, about average. Maintained temperatures below 50° for 11 hr. A well-made box of attractive appearance. **3**

Skotch Kooler, No. 101 (Hamilton Metal Products Co., Hamilton, Ohio) \$7.95.

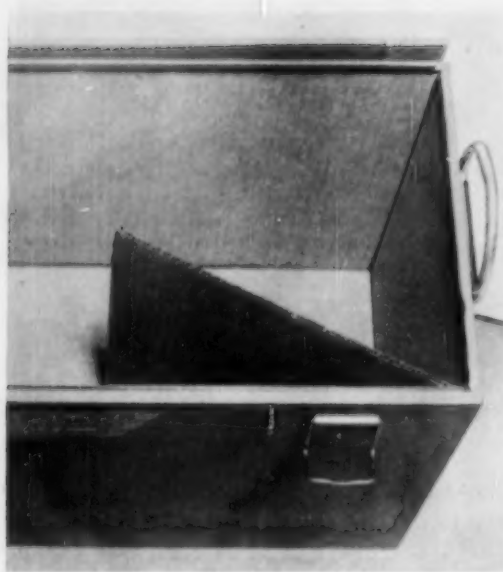
Description: Exterior, cylindrical-shaped steel with red and black plaid design. Size, 11½ in. in diameter, 14 in. high. No gasket on lid. Interior, steel with aluminum colored finish. Volume, 0.5 cu. ft. *Fiberglass* insulation. Plastic tray 9½ in. in diameter, 1 in. deep. Bail-type plastic handle. Lacked drain plug. Weight empty, 5 lb. 10 oz.

Performance in test: Cold-retaining ability, below average. Maintained temperatures below 50° for only 8 hr. An attractive box of mediocre performance. **3**

C. Not Recommended

Carlco Pic-nik, Model 12 (Carlisle Mfg. Co., Newark, N. J.) About \$10. Recently discontinued, but no doubt still being offered in many stores.

Description: Exterior, steel with mottled green finish. Size, 20 in. x 10 in. x 12½ in. Interior, galvanized steel. Volume, 1.2 cu. ft. Equipped with a separate container for ice, 9 in. x 4½ in. x 10¾ in. Insulation, single layer of corrugated



View of a portion of Carleo Pic-nik Model 12 ice chest, with inner wall liner removed, showing about 1/8-inch thick corrugated cardboard used as insulation.

cardboard. Had 2 plated-steel carrying handles, one at each end. Lacked drain plug and bottle opener. Weight empty, 13 lb. 7 oz.

Performance in test: Cold-retaining ability, poor. Maintained temperatures below 50° for only 7 hr. Insulation space of this box was only 3/8 in. thick. All other boxes were 3/4 to 1 in. **1**

Progress, Model A1 (Progress Refrigerator Co., Louisville, Ky.) \$15.50.

Description: Exterior, steel baked-enamel finish. Size, 19 in. x 14 in. x 19 in. No gasket in lid. Interior, galvanized steel. Volume, 1.4 cu. ft. Fiber glass insulation. Galvanized-steel tray with handle 15 1/4 in. x 10 1/4 in. x 4 in. Bail-type plated-steel handle. Drain plug with chain retainer. Built-in bottle opener. Weight empty, 22 lb. 4 oz.

Performance in test: Cold-retaining ability, about average. Maintained temperatures below 50° for 12 hr. Insulation not well sealed in lid, and there was some hazard of fiber glass working loose and falling on food. **1**

Thermaster, Cat. No. 341 (Poloron Products, Inc., New Rochelle, N. Y.) \$17.95.

Description: Similar to J. C. Higgins Cat. No. 6—07411 except larger (27 in. x 10 in. x 12 in.), and equipped with a separate container for ice, 9 in. x 7 in. x 4 1/2 in., instead of a tray. Volume, 1.1 cu. ft. Weight empty, 19 lb. 8 oz.

Performance in test: Cold-retaining ability, below average. Maintained temperatures below 50° for only 8 hr. **3**

Vagabond, No. 9023 (Hemp & Co., Inc., Macomb, Ill.) \$11.29.

Description: Exterior, steel with baked-enamel finish. Single sponge-rubber gasket on lid. Size, 20 in. x 11 in. x 12 1/2 in. Interior, galvanized steel. Volume, 0.7 cu. ft. Zerocel (mineral wool) insulation. Aluminum food tray 10 3/4 in. x 7 in. x 3 in. Two plated-steel carrying handles, one at each end. Drain plug. Separate bottle opener and ice pick. Weight empty, 16 lb. 14 oz.

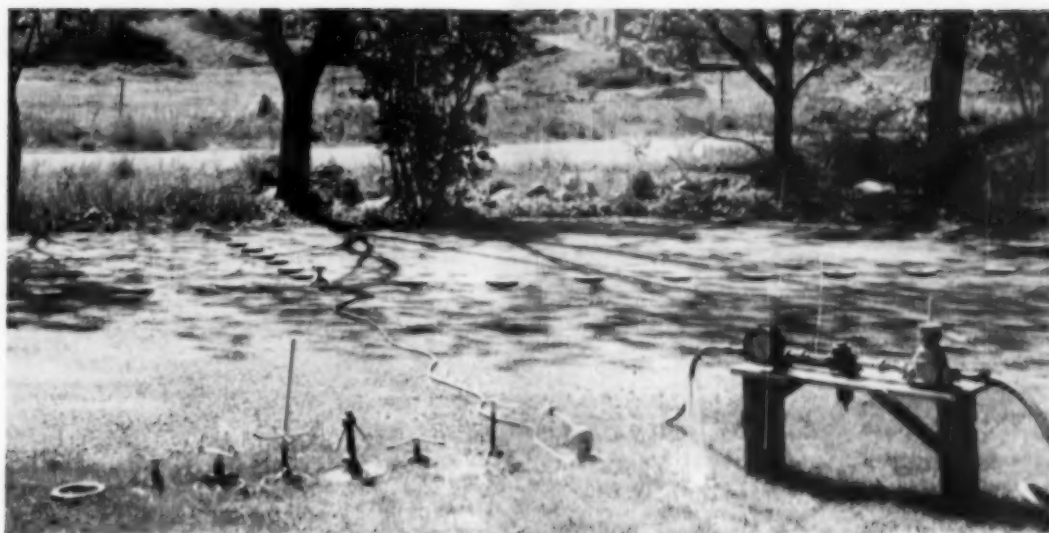
Performance in test: Cold-retaining ability, below average. Maintained temperatures below 50° for only 8 hr. Workmanship, fair. Insulation not well sealed in lid; some danger of insulation working loose and falling on food. Several sharp unfinished edges on lid and top of body. **3**

Standard Marking for Records

WITH a view to providing correct equalization for phonograph records by those who wish to play them to the very best advantage on high-fidelity equipment, two suggestions have been made: (1) that the manufacturers all use the same characteristic curve in their recording; and (2) that *whatever characteristic is used*, it should be clearly marked, using a uniform, industry-accepted nomenclature or symbol; this marking should be on the record jacket or in the center space of the record. The position of the symbol should be the same for all makers.

The solution to this problem is not simple, but it is one to which the manufacturers should give prompt attention by special conferences called by leaders in the industry; such conferences should include representation not only of the record manufacturers, but of persons well qualified in the techniques of reproduction of music by phonograph records, including representatives of the Bell Telephone System, and manufacturers of superior amplifiers, equalizers, and preamplifiers.

Lawn Sprinklers



General view of test area, showing the pans to catch the water and, at the right, the instruments used for the test—pressure gauge, pressure regulator, and water meter.

A BEAUTIFUL LAWN provides a pleasant and inviting setting for an attractive home. At the same time, it offers some practical benefits in that it helps prevent the washing away of soil, reduces the amount of sand and dust getting into the house, and helps keep the home cool by reducing the reflection of heat of the sun's rays upon the house.

Nearly all homeowners desire a nice lawn around their home, but not all put forth the considerable effort necessary to develop and maintain one, because of the work involved. An important problem for homeowners in most parts of the country is proper moisture supply, especially during dry spells. Watering is essential when the rainfall falls below an inch each week, which is estimated to be equivalent to 625 gallons of water for each 1000 square feet. This amount should suffice to penetrate the soil to a depth of four inches. Another important factor in supplying moisture is regularity of application.

Many of the best lawn grasses will go dormant quickly if the soil moisture falls below a certain point, but old, well-established lawns seldom collapse completely upon becoming parched; new plantings, on the other hand, require special care to insure their survival. A

new or good lawn can be injured by faulty watering. It should be watered only during dry weather, when suffering from lack of moisture, and should receive a thorough soaking, down to the grass roots, when it is done. Frequent shallow watering can actually be harmful since it encourages shallow roots near the surface of the ground. Deep roots are necessary for a permanent lawn that will survive through long dry spells.

There are several conflicting theories as to the proper time of day to water the lawn and each has some merit. Probably the most widely followed procedure is to water in the early evening, when the sun has lost its burning heat and there is less evaporation.

Sprinkling with the common hose and nozzle, hand held, is a time-consuming, often ineffective, method, though it will serve if you do not mind spending a lot of time with little action. As a way of encouraging contemplation and pure thought, it has some merit, like fishing from the bank of a placid stream. If watering is to be worth while, it should be done thoroughly and evenly to gain the proper benefit. One way this can be accomplished is through the use of a lawn sprinkler which distributes water "while you wait," over a given area, but the buyer

would have difficulty choosing one that would do this even moderately well, unless he has the opportunity of seeing it in operation.

There are many varieties of the several basic types of lawn sprinklers which include the rotating arm (see Figures 1 and 2), the oscillating or swinging spray (Figure 3), the fixed or ring type (Figure 4), and the single jet, mechanical rotating type (Figure 5). There are also so-called underground water systems which sell for as low as about \$11, which includes 20 feet of plastic pipe, brass fittings and parts, and two spray heads. One make consists of 8 sprinkler heads, 80 feet of flexible plastic pipe, which is set just a few inches under the lawn surface, and the necessary fittings, except valve, for about \$20. It is claimed to cover an area 20 x 40 feet. This type of sprinkler should not be used unless a vacuum breaker or check valve is installed, to prevent contaminated water being siphoned or sucked into the water supply lines of the house during a period when the water pressure fails, which can happen most anywhere at times. For example, water on a lawn may be contaminated by manure or poisonous weed killers. New York State is one that prohibits use of such underground systems under the sanitary code unless equipped with one of the safety features such as mentioned above, to prevent contaminated water from backing up into water pipes that will later carry water for drinking and cooking. One N.Y. water company requires use of both devices on an underground sprinkler system.

The most common types of sprinklers are the rotating arm or spinner, and fixed or ring type. The least expensive sprinklers are the fixed or ring type. The latter are also the most trouble-free, but they are relatively inefficient. To obtain a representative group of brands and models for this test, CR bought all sprinklers of the

common types generally available in stores in three near-by shopping centers.

Each sprinkler was tested to determine water coverage and evenness of distribution within a radius of 25 feet. Pans were placed at 2½-foot intervals to catch the water. After water had run at 60 pounds static pressure, for 10 minutes, the amount of water in the pans was measured and the evenness of distribution was plotted on graphs. The amount of water flowing through each sprinkler in a given time was measured with a water meter. This procedure was repeated at 20 and 40 pounds per square inch static pressure. All the sprinklers were judged to give poor distribution of water at 20 pounds, except the *Sunbeam*, which had fair distribution (see table).

A. Recommended

Craftsman, No. 6974 (Sears-Roebuck's Cat. No.

9-6974) \$3.65, plus postage (\$3.75 at retail store). A 4-arm rotating (spinner) sprinkler. Body of cast iron, painted. Arms and sprinkler heads of brass, chromium-plated. Listed in catalog as having stainless-steel bearing. Bearing fitted loosely. Water distribution at 40 and 60 lb. static pressure, good. **2**

Craftsman, No. 6972 (Sears-Roebuck's Cat. No.

9-6972) \$5.65, plus postage (\$5.79 at retail store). A 2-arm rotating (spinner) sprinkler. Body of cast iron, painted. Arms and sprinkler heads of brass, chromium-plated. Spray adjustable from very fine to coarse by adjusting nozzles as with common hose nozzle. Ball joints on heads of sprinkler permit adjusting for area coverage (a good feature). Distribution at 40 and 60 lb. pressure, good. **2**

Melnor, Model 550 (Melnor Metal Products Co.,

Long Island City, N.Y.) \$8.95. An oscillating lawn sprinkler. Operated by a water motor with adjustable arm to control area covered. This sprinkler covers a rectangular area. Sprinkler made of aluminum and a die-casting. Rubber bearing at outboard end. Distribution at 40 lb. pressure, fair; at 60 lb., good. **3**

Figure 1. A rotating arm sprinkler. This one, Craftsman 6972, is adjustable for both area covered and rate of flow of water used.

Figure 2. A rotating arm sprinkler. This one, Sunbeam Model K2, is adjustable for area covered.

Figure 3. An oscillating or swinging spray sprinkler, Melnor 550.

Figure 4. A fixed or ring type sprinkler, Allenco Ring.

Figure 5. Single jet mechanical intermittent-rotation sprinkler, Green Spot "Rainer."



Figure 1



Figure 2

	20 LB. STATIC PRESSURE			40 LB. STATIC PRESSURE			60 LB. STATIC PRESSURE		
	Gallons water per minute	Diameter of area covered ft.	Water distribution	Gallons water per minute	Diameter of area covered ft.	Water distribution	Gallons water per minute	Diameter of area covered ft.	Water distribution
<i>Allenco</i>	3	15	poor	6	20	poor	7	25	poor
<i>Craftsman 6974</i>	3	30	poor	5	50	good	6	50	good
<i>Craftsman 6972</i>	2	30	poor	4	50	good	5	50	good
<i>Sears 6975</i>	3	20	poor	6	45	fair	7	50	fair
<i>Green Spot "Rainger"</i>	(did not operate—see listing)			3	50	good	4	50	good
<i>Hubbard</i>	2	30	poor	4	45	poor	5	40	poor
<i>Sherman</i>	3	30	poor	5	50	poor	6	50	poor
<i>Sunbeam K2</i>	3	30	fair	4	50	fair	6	50	fair
<i>Melnor 550</i>	2	rectangular area 20x30	poor	4	rectangular area 35x45	fair	5	rectangular area 40x55	good

B. Intermediate

Sears, No. 6975 (Sears-Roebuck's Cat. No. 9-6975) \$2.10, plus postage (\$2.49 at retail store). A 3-arm rotating sprinkler. Body of cast iron, painted. Arms and sprinkler heads of brass tubing, not plated. Non-adjustable. Stainless-steel bearings. Distribution at 40 and 60 lb. pressure, fair.

Green Spot "Rainger" (Scovill Mfg. Co., Waterbury, Conn.) \$8.95. A single jet, mechanical rotating sprinkler. Rotation is actuated by a single nozzle stream striking a wedge, pushing the wedge and its arm sideways. A spring snaps the arm and the wedge back with a jarring action that rotates the nozzle. This action is repeated while the sprinkler covers a complete circle. It may also be adjusted to cover any sector of the circle and return with the same action. Base of cast iron, painted. Head and

nozzle of brass, wedge of aluminum. Bearings of stainless steel and nylon. A rather complicated design, but well constructed. Distribution at 40 and 60 lb. pressure, good. The sprinkler failed to rotate at 20 lb. static pressure. The bearing had become too tight; later, operation was satisfactory. This sprinkler would have received an *A-Recommended* rating if it had not failed entirely to operate in the test at 20 lb. pressure. Otherwise this was one of the best sprinklers in the test (though it is not possible yet to say how it would stand up in long use).

Sunbeam, Model K2 (Sunbeam Corp., Chicago) \$9.95. A 2-arm rotating (spinner) sprinkler. Adjustable for area covered by use of knob on top of sprinkler which rotates sprinkler arms to make spray cover large or small area (markings from 5 to 50 ft.). Base of cold rolled steel, body of cast iron. Arms and nozzles, brass, chromium-plated. Ad-



Figure 3



Figure 4



Figure 5

justment knob of plastic. Bearings of bronze (good). Construction, very good. Distribution at 40 and 60 lb., fair. 3

C. Not Recommended

Allenco Ring (W. D. Allen Mfg. Co., New York City) \$1.98. A well-constructed ring sprayer of brass, approx. 8 in. in diameter and 1½ in. high. No moving parts. Had high water consumption and covered the smallest area of any sprinkler tested. Spray emitted, very fine—would evaporate readily or be blown away in a slight breeze, especially in a slight wind. Distribution at 40 and 60 lb., poor. 1

Hubbard (Hubbard Mfg. Co., Minneapolis 2) \$4.25.

A 3-arm rotating sprinkler. Body of aluminum, painted. Arms and head, steel, nozzles of brass. Two sets of ball bearings, one inside water intake, the other exposed at top (which is considered undesirable). Bearing races of brass. Distribution at 40 and 60 lb., poor. 2

Sherman (H. B. Sherman Mfg. Co., Battle Creek, Mich.) \$3.95. A 3-arm rotating (spinner) sprinkler. Body of cast iron, painted. Arms and nozzles, brass, chromium-plated. Non-adjustable. Bearings, brass on brass. Construction, good, except bearings. Distribution at 40 and 60 lb., poor. 2

Amana Freezer

FOLLOWING CR's test of the *Amana* upright freezer reported in the August 1954 issue, we were advised by the manufacturer that extensive changes had been made in the *Model 12E*, and that the improved model would be designated as the *12F*. It was stated that the capacity of the refrigerating system had been increased by increasing the amount of evaporator tubing used, without changing the compressor displacement. As this would reduce running time and power consumption and provide a greater margin of capacity for food freezing, new tests were undertaken.

The freezer was supplied by the manufacturer with an affidavit stating it was taken at random from stock and not specially selected for test. The tests were made by the same laboratory that made the original tests for CR, and under the same conditions. The results of these tests showed that the pull-down time (a measure of its quick-freezing capacity) had been improved (reduced) by about 15 percent, making it easily the best of the 8 freezers tested in this respect. There was also a reduction in estimated operating costs of about 20 percent (from \$2.60 to \$2.10 per month).

B. Intermediate

Amana, Model 12F (Amana Refrigeration Inc., Amana, Iowa) \$400. (\$33.90 per cu. ft.)

Dimensions: Height, 65¼ in.; width, 32¾ in.; depth, 26¾ in. Total rated capacity, 11.7 cu. ft. (actual,

11.8 cu. ft.). Area of surface for quick freezing, 10 sq. ft.

Description: Had 4 compartments for storage of food; the bottom compartment was equipped with an adjustable wire shelf. The 3 shelves and top and bottom of cabinet are refrigerated. 3 wire racks in full-length door. Machine compartment at bottom. Condenser cooled by a small electric fan. Single outside door which had built-in heater coil to minimize condensation. Cold control located in machine compartment and marked "Off, 1, 2, 3, 4, 5, 6, 7." No warning light or signal to indicate when unit was not operating satisfactorily. Exterior finish, white lacquer. Interior finish, anodized aluminum with pebbled finish.

Performance in test: In no-load test at 90°, ranked fifth (with *Kelvinator*) in energy consumption per cu. ft. per month of 8 freezers tested. In storage of food, energy (electricity) consumption per month per lb. of food was high (50% higher than that of best freezer tested in this group). Ranked first in pull-down test; 0° attained in only 1.4 hr. of running. Probable cost of operation under normal conditions with electricity at 2c per kwhr., \$2.10 per month (17.8c per cu. ft.). ¶Except for its relatively high monthly operating cost, this freezer would easily warrant an A rating. At average rates for electricity, its cost of operation would be about \$8.50 per yr. (50% more than that of the exceptionally economical *GE HU-11L* (only about 5% more than the average upright freezer tested by CR). For the substantial number of persons whose use of a freezer is such that they often want rapid freezing of heavy loads of fresh food, the extra 70c a month operating cost over the *GE* (10c over the average freezer) may be a reasonable amount to pay for this advantage. The *Amana 12F* was easily the best freezer tested in speed of freezing.



The Old (about 1800) and the New (1955) in sunglasses.

The Selection and Use of Sunglasses

BY MATTHEW LUCKIESH, D.Sc., D.E.

AN overwhelming majority of persons need no special *protection* for their eyes against sunlight and skylight outdoors. However, under some conditions sunglasses can be helpful in decreasing the discomfort caused by glare, particularly glare caused by brilliant light and bright reflections encountered on beaches, in the desert, and even on sun-drenched highways. The word *protection* is misleading when applied to guarding the eyes in commonplace visual environments outdoors. On the other hand, the general public needs the protection of sound knowledge as against unwarranted implications of dangers of exposure to solar energy reflected from sky, water, sand, and the landscape in general. In addition, there are other aspects of sunglasses such as color, absorption of radiant energy, transmission of light, and optical quality. Finally there is the matter of when to wear them and when not to wear them.

Ultraviolet and infra-red energy outdoors

The eyes and visual sense are adapted to use most efficiently the light from the sun. The eyes and the entire human being also are adapted to intensities of ultraviolet and infra-red energy which accompany sunlight, but these radiations, though they can affect the body, are not seen. Much of the ultraviolet energy present in sunlight does not reach the earth, but is absorbed in the upper regions of the atmosphere. Adver-

tising for many sunglasses will indicate, however, that their use is very necessary to protect the eyes from harmful ultraviolet and infra-red rays in sunlight.

CR would emphasize that ordinary clear colorless glass, and most of the clear colorless plastics, effectively absorb the sunburning (erythema) energy in sunlight; and there is no more reason to protect the eyes from the erythema (skin reddening and tanning) energy outdoors than there is to protect the skin of the face. Nevertheless, the summer sojourner at the shore uses protective lotions on the skin, and he will find sunglasses will serve usefully to reduce the visual discomfort due to excessive light and brightness encountered on beaches.

Beyond the red end of the visible spectrum of sunlight and skylight is the infra-red region. Some of the infra-red energy is absorbed by the water vapor in the atmosphere. Infra-red energy does not affect or injure human tissue as short-wave ultraviolet energy does. In quantities reaching the earth's surface outdoors, infra-red energy is not injurious to the eyes or skin. Indeed, while enjoying the flames of a fireplace, the eyes are sometimes subjected to higher intensities of infra-red energy than they are outdoors, without any evidence of harm. Therefore, implications that special kinds of sunglasses are needed to protect the eyes from infra-red and even ultraviolet energy outdoors are misleading.

At this point a proponent of sunglasses may ask, "How about snowblindness?" since snow is an excellent reflector of ultraviolet energy. At high altitudes, as on a snow-capped mountain, the intensity of this energy is greater than in surrounding valleys, and eye protection will be needed. Thus, the eyes of skiers in the Alps or other high mountains may be subjected to excessive exposures of short-wave ultraviolet. Since ordinary earth surfaces are very poor reflectors of this energy, the intensity of erythema reaching the eyes on bathing beaches, for example, is a very small fraction of that on sunlit snow at high altitudes, or even at high latitudes, such as the polar regions in the summertime. At ordinary altitudes, where snow is present only during winter months, very little harmful energy reaches the earth to be reflected by the snow.

The conclusion is that most persons under most conditions do not need sunglasses to *protect* the eyes. However, sunglasses can help to *reduce visual discomfort* under conditions of an abundance of light and brightness, and it is unfortunate that so many misleading implications are made regarding their use and so many attempts made to make them seem indispensable.

Visual discomfort outdoors

Although human eyes are generally well adapted to strong light outdoors, there are conditions which cause discomfort. If one is inclined to squint continually, and does not ordinarily do so indoors, the visual environment is causing discomfort. This discomfort may or may not be obvious since it is not necessarily limited to undue strain on the eye muscles or limited to the region of the eyes. In general, the conditions that are merely annoying when one is engaged in casual seeing can cause severe discomfort and even serious aftereffects, when one is engaged in prolonged critical seeing such as reading or other close work.

Glare outdoors is generally due to an abundance of light coming from large bright areas such as the sky, a sandy beach, or an expanse of snow. Even white buildings and stretches of concrete pavement drenched in sunlight can cause excessive squint and discomfort. Glare from an expanse of sky is readily reduced or eliminated by anything acting as a visor which shades the eyes from light coming from well above the horizontal. Nevertheless, large bright areas in the lower portion of the visual field, such as an expanse of sunlit sand, are often very annoying and can cause great discomfort.

Sunglasses, if properly chosen, can serve very

well in reducing glare. However, proper selection depends upon the places and activities involved. In the matter of selecting proper sunglasses, manufacturers of such products could be more helpful than they have been, if they would indicate such optical properties as the absorption and transmission of light, expressed in percentages. These are the most important basic factors that determine correct selection of sunglasses.

Color of lenses

The color range of sunglasses available on the market is generally satisfactory. Shades of colors varying through tints of blue-green, green, yellow-green, and yellow are available. Actually a neutral shade is best, for it does not alter the color of objects. Sunglasses of very dense colors should be avoided. Fortunately, few of these are available. Among the colored sunglasses, a yellowish green distorts the colors in nature less than any other tint. If sunglasses are to be worn while driving an automobile in the daytime, the purchaser should be certain that the color of the lenses is not so intense that colors of traffic signals may be confused. Sunglasses for daytime driving should not be too dense and sunglasses of any kind should not be worn while one is driving at night, or even on cloudy days.

There is a psychological factor worth considering. Sunglasses which absorb or cut out a moderate amount of light and have a yellowish tint will make cloudy and even rainy days appear cheerful. Prolonged tests of this phenomenon in the woods in the summertime indicate that this is an aspect worth considering. Yellow and yellowish-green glasses reduce the brightness of the blue sky relatively more than they reduce the greens of vegetation. This is an important factor when choosing sunglasses for general use outdoors.

Size of lenses

This is determined largely by one's taste, comfort in use, and convenience. A more important matter is the size of the frames, which determines the distance between the centers of the two lenses. This distance should be about the same as the distance between the two eye pupils. The purchaser can judge well enough by wearing the glasses and carefully noting his pupils in relation to what appears to be the centers even of odd-shaped lenses. Sunglasses having no optical power (magnification) do not require accurate fitting except as to appearance and comfort. Naturally, glasses ground to your

prescription should be fitted properly, by an expert.

Total transmittance of light

Although sunglasses are available throughout a wide range of density or transmittance [1], actual values are not available to the purchaser. This is an important matter that should be given close attention, and manufacturers should make a beginning in the education of users. In the listings, measurements of a large number of sunglasses, over a wide range of prices, reveal a variation in total transmittance for average daylight from 7 percent to 54 percent. Although a wide range of transmittance is available, selection of the best lens for a given purpose is a matter of personal judgment. At best, the purchaser of glasses can estimate this particular quality only roughly. If the sunglasses are to be worn only on the beach, there is little doubt that a transmittance of 20 percent or less is desirable. In other words, the purchaser could probably obtain satisfactory results by choosing the densest lenses available, for beach wear.

Quick, certain, and safe seeing are at their best in the daytime on the highways. If sunglasses are to be worn while driving an automobile on sunlit highways, actual experiments and observations indicate that a transmittance of 20 percent or less is generally too low. Even though dense glasses reduce brightness to 20 percent of normal, one can still see better with them in daytime than one can see at night without tinted glasses. However, the consensus of the subjects in the experiments was that very dense sunglasses were a handicap except during midday in full sunlight.

It appears that a moderate transmittance in the region of 30 percent would be better for driving on sunlit days. Fortunately, among the sunglasses actually measured and regardless of price, about half had transmittances in the range from 25 to 35 percent. These glasses might not be dense enough for complete comfort on the beach but they should greatly reduce visual discomfort. In the neighborhood of 30 percent transmittance appears to be a good compromise.

For the special case of cloudy days mentioned in "Color of lenses," sunglasses having less dense yellow lenses with a transmittance in the range of 50 to 75 percent were found to be satisfactory.

The uniformity of total transmittance over various parts of the lenses was excellent for all

the sunglasses. Also the total transmittance of the two lenses in each pair of sunglasses was generally the same. There were two exceptions, the Bausch & Lomb *Ray-Ban* at \$7.75 and the American Optical *Calobar* glasses which sell for \$6.75. In both cases one lens transmitted about 10 percent more light than the other lens. This is not a serious defect, but it should not be present in a high-priced pair of sunglasses, particularly since the defect was of a kind that was once common in the cheaper sunglasses.

Sunglasses which contain a polarizing material not only reduce the general diffused brightness, but especially that due to reflections from smooth surfaces. For example, the lens transmits about 27 percent of diffusely reflected sunlight. That is, it reduces the brightness of the sky or sandy beach about 73 percent. However, it reduces the brilliant images of the sun, for example, that are reflected by smooth surfaces, even more. There are special cases where bright reflections are involved, where *Polaroid* sunglasses can serve excellently.

Colored lenses with an exterior metallic coating are represented by two Bausch & Lomb *Ray-Bans*. By careful application of the thin metallic coating, a wide range of transmittance can be obtained. The top portion of one *Ray-Ban* transmitted about 13 percent compared with about 30 percent for the middle and lower part. On the other pair, the top and lower parts transmitted only about 7 percent while the middle portion transmitted about 30 percent. Gradation in application of a thin metallic coating to lenses has possibilities in special cases. The purchaser can determine for himself whether he can use or needs such special ranges of transmission.

Some specimens of glass and plastic fluoresce when exposed to sunlight or skylight outdoors. This results in a slight veil of diffused light over the entire lens. The unbranded sunglasses shown in the listings had plastic lenses that exhibited this property. The effect of this veil of light is undesirable, and such materials are to be avoided. Lenses for sunglasses should be transparent, not diffusing even in the slightest noticeable degree.

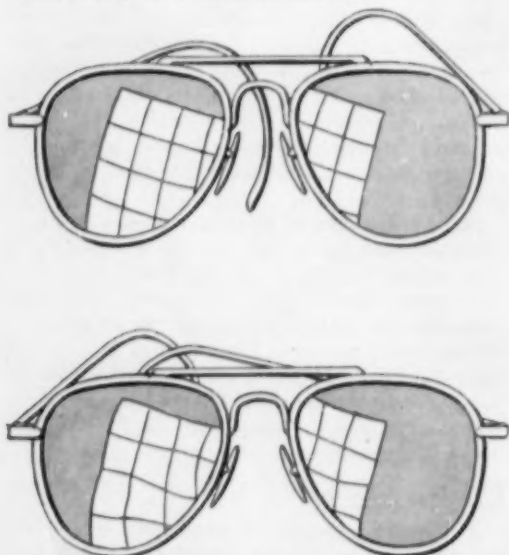
Optical quality

The optical quality of sunglasses is scarcely as important as it is in prescription eyeglasses. However, undue distortion of images can be more than annoying. There is no basic reason why cheap lenses whether of plastic or glass cannot be practically free of distortion. However, examination of not only those glasses listed in the table but many others on sale in

[1] Generally speaking, the transmittance of a particular lens gives an indication of the ratio between the amount of light passing through a lens and the total amount falling on it, expressed as a percentage.

retail stores revealed a far greater prevalence of distortion among the inexpensive sunglasses than in those of higher price. The process of manufacture of cheap lenses apparently accounts for extra distortion. In addition, lack of adequate inspection may also account for greater prevalence of distortion among the inexpensive sunglasses. Distortion is undesirable but some degree is doubtless permissible in sunglasses that are to be used only for casual seeing as, for example, on the beach. But if they are to be used for critical seeing such as reading, and for driving, any distortion should be too slight to be evident.

A fairly simple test can be made for distortion with a test-object consisting of black parallel lines viewed against a very bright background. Even a straight edge of a window outlined against the sky is satisfactory, but a series of parallel lines is better. These straight lines are viewed in turn through each lens of the sunglasses which are held a few inches from the eyes. As the lens is moved about and rotated, distortion of the lines will indicate a wrinkle, bulge, or other defect in the lens. If no distortion of the straight lines is detectable, the optical quality is satisfactory for ordinary sunglasses. If a slight distortion is detectable but not noticed when the lenses are actually worn, they may be satisfactory for their intended use.



Optically ground and polished lenses can be distinguished from those that are "thermally curved" by viewing the image of a window by reflection from the front of the lenses. If the image seen does not change shape as it is made to pass across the surface of each lens as the glasses are tilted and turned, the lenses are optically ground and polished to the correct curve. This test, of course, may not be applicable to lenses ground to prescription.

Most of the sunglasses selling for \$1 or less showed some noticeable distortion. In fact, practically all of the glasses except those ground and polished to shape showed some distortion near the edges of the lenses. For casual wear on the beach, such slight distortions detected by the test described are not too serious. Some of the cheap lenses showed considerable distortion. In addition, a small pronounced defect was occasionally found in the more important area of the lens. In these cases factory inspection was evidently inadequate.

There are two methods employed in manufacturing lenses for sunglasses. The very good lenses are ground and polished to a true curve and show a superior image. "Thermally-curved" lenses, initially flat, are heated to develop the desired curvature.

Lenses that are ground and polished are likely to be of good optical quality.

Plastic lenses are likely to be less readily cleanable than glass and will lose their perfect transparency by scratches or by any unremovable foreign matter. This means a deterioration in optical quality.

The glasses tested happened to be those meant for use by men, unless otherwise indicated. Glasses were selected primarily so that the test would include representative lenses of leading manufacturers. In most cases, sunglasses having the same kinds of lenses are available in frames suitable for women. Density refers to the shade of the glass used in the lenses; a low-density lens allows more light to enter the eye than one of high density (actual percentage transmittance—the reverse of density—is shown in parentheses following the verbal statement of density). ¶The material of the lenses was glass unless otherwise noted. Comments on construction do not relate to finish or appearance but only to serviceability. ¶The recommendations that follow are made by Consumers' Research, on the basis of the optical tests conducted by Dr. Luckiesh.

A. Recommended

Solalex 650 (Backmann Bros., Inc., Philadelphia)

\$9c. Metal frames of good construction. Lenses thermally shaped; very slight optical distortion. Medium density (37%). No case. Green lenses. **1**

Willson G249 (Willson Products, Inc., Reading, Pa.)

\$2.49. Metal frames of very good construction. Lenses thermally shaped; slight distortion. High density (23%). Plastic case. Green lenses. **2**

Willson G820 (Willson Products, Inc.) \$4. Metal

frames of very good construction. Lenses thermally shaped; slight distortion. High density (20%). Plastic case. Green lenses. **2**

Willson MP60 (Willson Products, Inc.) \$3.95. Plastic frames of very good construction. Lenses thermally shaped; slight distortion. High density (23%). Plastic case. Green lenses. 2

Calobar C12-50 (American Optical Co., Chelsea 50, Mass.) \$6.75. Plastic frames, metal-reinforced temples; very good construction. Lenses ground and polished to true curve; no distortion. Suitable for reading and driving in bright sun. Medium density (29%). Leather-and-plastic case. Green lenses. 3

Cosmetan (American Optical Co.) \$6.75. Plastic frames, metal-reinforced temples; very good construction. Lenses ground and polished to curve; no distortion. Suitable for reading and other close use in bright sunlight. High density (20%). Leather case. Brown lenses. 3

Cosmetan-Polaroid (American Optical Co.) \$11.75. Plastic frames, metal-reinforced temples; very good construction. Lenses ground and polished to curve; no distortion. Suitable for reading and other close use in bright sunlight. High density (17%). Leather case. Brown lenses, heavy. 3

Deluxe (American Optical Co.) \$5.95. Plastic frames, metal-reinforced plastic temples; very good construction. Lenses ground and polished to curve; no distortion. Suitable for reading, driving, and other close use. Medium density (33%). Plastic case. Green lenses. 3

Ray-Ban (Bausch & Lomb Optical Co., Rochester, N.Y.) \$9.95. Plastic frames, metal-reinforced temples; very good construction. Lenses ground and polished to curve; no distortion. Suitable for reading and other close use. High density (20%). Leather case. "Neutral" gray lenses (G-15). 3

Ray-Ban (Bausch & Lomb Optical Co.) \$7.75. Plastic frames, metal-reinforced temples; very good construction. Lenses ground and polished to curve; no distortion. Suitable for reading, driving, and other close use in bright areas. Medium density (30%). Leather case. Green lenses. 3

Ray-Ban with Gradient Density, Cat. No. 6A8307 (Bausch & Lomb Optical Co.) \$14.50. Metal frames of very good construction; plastic earpieces at temple ends. Lenses ground and polished to curve; no distortion. Lenses were partially coated, with mirror-like reflective film at top and bottom of lenses. Suitable for reading in bright sunlight. Medium density (30%) at horizontal area in center; high density (7%) at top and bottom. Leather case. Green, metallized lenses. 3

Ray-Ban with Top Gradient Density, No. 6A7307 (Bausch & Lomb Optical Co.) \$14.50. Metal frames of very good construction; plastic earpieces at temple ends. Lenses ground and polished to curve; no distortion. Lenses were partially coated with mirror-like reflecting film at top. Suitable for reading or other use in bright sunlight. Medium density, lower portion (30%); high density, upper portion, varied from 30% to 13% at top. Leather case. Green metallized lenses. 3

Willsonires G80 (Willson Products, Inc.) \$6.50. Metal frames of very good construction. Lenses ground and polished to curve; no distortion. Suitable for reading or other close use. High density (23%). Leather case. Green lenses. 3

B. Intermediate

American Polaroid US 1943 (Apparently made by American Optical Co. for U.S. Armed Forces; purchased from J. Shannon & Co., 218 N. 22 St., Philadelphia) \$1. Plastic frames, metal-reinforced temples; good construction. Lenses, sheet plastic; slight distortion. High density (20%). Leatherette case. Neutral lenses. 1

Fosta Certified Safe Lens (Foster Grant Co., Leominster, Mass.) 59c. Ladies'. Plastic frames, medium quality. Lenses thermally shaped; moderate distortion. Medium density (35%). No case. Green lenses. 1

Willson Y11C (Willson Products, Inc.) 39c. Plastic frames of below-average quality. Lenses thermally shaped; moderate distortion. High density (17%). No case. Neutral lenses. 1

Willson G16 (Willson Products, Inc.) \$2.98. Metal frames of good construction with plastic earpieces at temple ends. Plastic (shaped) lenses (see text); slight distortion. Low density (54%). Plastic case. Green lenses. 2

Zephyr, No. 78L (American Optical Co.) \$1.98. Plastic frames; average construction. Lenses, shaped plastic (Polaroid); slight distortion. Medium density (27%). Plastic case. Green lenses. 2

* * *

Columbia Protektosite (Columbia Protektosite Co., Inc., Carlstadt, N.J.) 98c. Metal frames, plastic eyepieces at temple ends; of good construction. Lenses thermally shaped; moderate distortion at edge, and one lens exhibited rippled effect indicating poor quality control. Medium density (35%). Plastic case. Green lenses. 1

Fosta 6018 (Foster Grant Co.) 98c. Combination metal and plastic frames of relatively poor construction. Lenses thermally shaped; moderate distortion. High density (15%). No case. Neutral lenses. 1

Fosta 1497 (Foster Grant Co.) 29c. Plastic frames; quality of hinges judged poor. Lenses thermally shaped; slight distortion. Medium density (37%). No case. Green lenses. 1

Protex (Comptone Co., Ltd., 1239 Broadway, N.Y.C.) \$1. Brown plastic frames of medium quality. Lenses thermally shaped; one lens had excessive distortion within field of view. Medium density (37%). No case. Green lenses. 1

C. Not Recommended

Unbranded. Brown plastic frames of below-average quality. Each lens formed from thin plastic sheet held at top by frame; considerable distortion. Lenses badly out of alignment (at an angle to each other). Medium density (27%). D-shaped green lenses.

Single-lens reflex cameras



Exakta VX

THE HISTORY of the 35 mm. camera began about 25 years ago in Germany when Leitz offered the *Leica* built to use low-cost perforated movie film and having the advantage of interchangeable lenses. In 1932, a built-in optical range-finder to take the guess work out of focusing was added, and that same year saw the introduction of a competitor from the great Zeiss works, the *Contax*. To this day, these two cameras are the "big name" cameras in the 35 mm. field; *Leica* alone has close to 65,000 registered owners in the United States.

Many, however, prefer the single-lens reflex type of miniature camera for certain advantages which it offers. It is the ideal 35 mm. camera for the careful scientific worker, for the meticulous craftsman who wants the best possible, most accurately framed and focused pictures, and for the highly skilled amateur whose standards of workmanship are high.

The single-lens reflex gives an opportunity to study the scene on a ground glass which shows exactly what the camera sees up to the moment that the picture is actually taken. The single-lens reflex camera lends itself particularly well to the demands of medical photography. It is possibly used more by doctors, dentists, and naturalists than by any other segment of the population. This kind of reflex has proven itself in nature photography where the super-long-

This article is the fourth of a series of articles on miniature cameras. Part III, which discussed the higher-priced 35 mm. cameras, was in the June 1955 CR Bulletin; Part II, which discussed 35 mm. cameras up to \$100, in the October 1954 Bulletin. Part I, which discussed cameras in general and specific makes of cameras without range-finders priced up to about \$60, appeared in the September 1954 Bulletin.



Contaflex

focus telephoto lenses are used to best advantage, and for photomicrography where the ground-glass image gives an unexcelled view of what is to be taken.

The dependence of this type of camera on the user's ability to compose the picture on the ground glass does limit its use where pictures must be taken quickly and where light is weak. Some, however, also have range-finders to permit accurate focusing when use of the ground glass is impracticable by reason of weak light or need for fast action. All of the single-lens reflexes (except the *Tower "23"* and the *Contaflex I* and *II*) feature the advantage of being able to use a variety of lens focal lengths, to give the photographic versatility that only a battery of lenses (each lens costing from about \$50 to \$200 or more) can provide. There is now a supplementary telephoto lens at \$110 available for the *Contaflex* which fits on the front of the non-removable *Tessar* lens.

With several lenses to choose from, one may

use a short-focus wide-angle lens for a scenic panorama, the normal lens for routine vacation-time photography, and a telephoto lens to capture details of a distant scene.

Lenses and shutter speeds

35 mm. cameras are often equipped with ultra-fast lenses, which were once thought to be their outstanding primary advantage, as these lenses permitted taking of pictures under adverse light conditions. Today, with almost all cameras synchronized for flash and with the very fast films available, the average amateur photographer will have little need for such fast lenses—will, indeed, often take better pictures with a slower lens. The new *Kodak Ektachrome* daylight color film is over three times as fast as *Kodachrome*; recommended exposures for the new film range from 1/50 second at *f*/11 to 1/50 second at *f*/4 for average subjects; with blue flashbulbs, 1/25 second at *f*/11 for subjects at 8 feet. For black-and-white photography, there is the new *Kodak Tri-X* with an announced exposure index of 200 daylight or twice as fast as *Kodak Super XX*. It is claimed that prints of good quality have been obtained with *Tri-X* using A.S.A. exposure indexes higher than 1000 (for indoor pictures with ordinary room lighting).

Shutter speeds should not be taken as highly accurate in any case, but the various rated speeds on shutters of good makes usually fall within limits acceptable to amateurs and professionals. The standards of the American Standards Association for focal-plane shutters with which most single-lens reflex cameras are equipped permit a 25 percent error for 1/400 second and slower, and a 33 percent error for speeds faster than 1/400 second. Because shutters are spring-actuated, all will slow down a few years after manufacture and, particularly at the slower speeds, following periods of inactivity. The shutter will keep its accuracy longer if it is released (not left under tension or cocked) when it is not being used.

Japanese cameras

Because German optical goods have had a near-monopoly for many years in this country, the average American has believed German standards to be the most exacting of any manufacturing country. That the Japanese had evolved a successful precision-optical industry was not realized until American military men brought back the information during World War II. The submarines flying the Rising Sun had a "night" periscope of greater light-gathering capacity than our own advanced models,

according to Commander Edward L. Beach, currently Naval Aide to the President. This was typical of the success of Japanese optical technicians. During the Korean War, American photographers passing through Tokyo learned about the ingenious camera designs and precision photo lenses of Japanese makers.

35 mm. single-lens reflex cameras

A. Recommended

Exakta VX (Distributed by Exakta Camera Co., 705 Bronx River Rd., Bronxville 8, N. Y.) \$316.50 with *Zeiss Tessar f*/2.8 coated lens of 50 mm. focal length, *Penta Prism* eye-level view-finder, and split-image range-finder. Case, \$12 extra. Made in Eastern (Russian) Zone of Germany. Focuses by movement of lens in helical mount. Focal-plane shutter with rated speeds from 1/1000 to 12 sec., time, and bulb. Synchronized for FP and F bulbs and electronic flash. Delayed-action release. Pre-set diaphragm which permits setting a stop at the desired aperture; lens can then be opened to full aperture to provide more light for focusing; then, before picture is taken, the aperture can quickly be returned manually to the opening that had been set by the stop. Advancing the film cocks the shutter. The camera has a built-in knife which permits part of the exposed film to be removed for development before the completion of exposures on the entire roll. A wide assortment of interchangeable lenses is offered. In addition to the usual reflex viewing on the ground glass, the *Exakta VX* has an eye-level *Penta Prism* view-finder and range-finder. Lens quality, good. Shutter and winding mechanisms have given some trouble, but over-all construction, engineering, and finish are of high caliber. This make offers the most in versatility in auxiliary equipment and choice of interchangeable lenses of any single-lens reflex camera.

Exakta VX Automatic (Exakta Camera Co.) \$392 with *Zeiss Biotar f*/2 lens of 58 mm. focal length with automatic diaphragm, *Penta Prism* view-finder, and split-image range-finder. Case, \$12 extra. Similar to *Exakta VX* listed above except for faster lens, and automatic diaphragm which stops down the lens to desired aperture when the shutter is tripped. Quality of lens, variable, ranging from good to poor. It is doubtful whether the faster lens and the automatic diaphragm, which will be mostly of value to photographers of sporting events, is worth the additional \$75 over the same camera with *Zeiss Tessar f*/2.8 lens.

Tower "23" (Distributed by Sears, Roebuck & Co.; also known as *Asahiflex*) \$77.50 with *Asahi-Kogaku Takumar f*/3.5 coated lens of 50 mm. focal length, focusing from 2½ ft. to infinity by rotation of knurled rim of lens mount. Case, \$6.50 extra. Made in Japan by Asahi Optical Co., Ltd., Tokyo. Pre-set aperture device which sets a stop at desired aperture. Lens can then be opened to full aperture to provide more light for focusing; then before picture is taken



Tower "23"

the user turns the diaphragm ring to the stop. Focal-plane shutter with 5 rated speeds from 1/25 to 1/500 sec., and bulb. Synchronized for FP type flash lamps and electronic flash. Advancing film cocks shutter. Double-exposure prevention. Eye- and waist-level view-finders. Built-in magnifier for waist-level finder. Quality of lens, good. Shutter speeds, satisfactory at 1/25, 1/50, and 1/100 sec., 40% slow at 1/200, 50% slow at 1/500 sec. Considered the best single-lens reflex camera tested to date in the lower-priced field.

B. Intermediate

Alpa 7 (Distributed by Karl Heitz, Inc., 480 Lexington, New York 17) \$429 with *Schneider Xenon f/1.9* coated lens of 50 mm. focal length. Case, \$15 extra. Made in Switzerland. Focuses by turning large knurled ring close up against the camera body (somewhat awkward to use). Focal-plane shutter with rated speeds from 1/1000 to 1 sec., time, and bulb, synchronized for electronic flash and type FP flash lamps; delayed-action release. An assortment of interchangeable lenses is available. Eye-level finder (magnification about 2x with 50 mm. lens) and ground-glass focusing through a single window. Also has separate eye-level finder (adjustable for lenses of different focal length) combined with superimposed-image coupled range-finder. Single knob for winding film and cocking shutter. Double-exposure prevention, permitting multiple exposures when desired. Range-finder window is located at the bottom of the camera, where view is easily blocked by the hand holding the camera. Quality of lens, satisfactory.

Alpa 4 at \$319 and **Alpa 5** at \$389 are similar to **Alpa 7** except that they lack coupled range-finders and self-timers, and **Model 4** has no prism in the ground-glass view-finder.

Contaflex I (Carl Zeiss, Inc.) \$169 with *Zeiss Tessar f/2.8* coated lens of 45 mm. focal length. Case, \$14 extra. Made in Western Zone of Germany. Focuses by rotation of a ring on lens mount. *Synchro-Compur* shutter with rated speeds of 1/500 to 1 sec.,

and bulb, fully synchronized for flash. Pre-set diaphragm which closes automatically to predetermined aperture when exposure is made. Eye-level finder and focusing through a single window. Coupled range-finder of split-image type is viewed in center of Fresnel lens screen; focusing can also be done on ground-glass ring surrounding range-finder image. Film advance winds shutter mechanism. Quality of lens, only fair on two samples tested. (One had noticeable curvature of field.) The shutter was inaccurate by 30% at 1/25 sec. Combined range-finder, ground-glass focusing, and viewer very easy to use even for a person wearing glasses. Construction excellent throughout.

Contaflex II (Carl Zeiss, Inc.) \$199. Same as **Contaflex I** but has built-in light meter (not considered desirable).

Rectaflex (Omic-Optics, Inc., 202 W. 40 St., New York 18) \$329.50 with *Schneider Xenon f/2* coated lens of 50 mm. focal length. Case, \$15 extra. Made in Italy. Focuses by movement of lens in helical mount. Focal-plane shutter (with jeweled bearings in timing mechanism) with rated speeds of 1/1300 to 1 sec. synchronized for electronic flash and FP bulbs. Eye-level ground-glass focusing; also built-in coupled range-finder. Had means for preventing double exposures. Interchangeable lenses available. Quality of lens, satisfactory, but a similar lens on a previous sample performed poorly. Quality of workmanship and construction, excellent. The shutter has a "lifetime guarantee," and the manufacturer offers a free annual factory check. **Rectaflex** provides film and processing to buyer to permit field testing at time of purchase.

Rectaflex Turret (Omic-Optics, Inc.) \$585 with *Angenieux f/1.8* coated lens of 50 mm. focal length. Pre-set diaphragm with sunshade. Similar to **Rectaflex**, except that three lenses can be used in a turret mount similar to that used on movie cameras. Heavy and awkward to use, even with gun-stock mount. Construction and finish, satisfactory, but considered too specialized and expensive to be of interest to many consumers.

C. Not Recommended

Astra 35 FX (Distributed by Sterling Howard, 561 E. Tremont Ave., New York 57) \$109.50 with *Zeiss Tessar f/2.8* coated lens of 50 mm. focal length. Made in Eastern (Russian) Zone of Germany. Focal-plane shutter with rated speeds of 1/500 to 1/2 sec. Synchronized for FP flash bulbs and electronic flash. Combined reflex finder and eye-level sports finder. Sold under various names at varying prices.

Astraflex, Hexacon, Verikon, and Contax D or S range in price from \$85 to \$125 and are apparently other names for **Penlacon** (see page 21). It seems that importers have registered their own brand names and established their own prices. Note that **Contax D or S** is not to be confused with **Contax** cameras made in the Western Zone of Germany and marketed by Carl Zeiss, Inc., of New York.

Pentacon (Distributed by Prakticon Co., Inc., 705 Bronx River Rd., Bronxville 8, N. Y.) \$259.50 with *Westagon* f/2 coated lens of 50 mm. focal length. Case, \$15 extra. Made in Eastern (Russian) Zone of Germany. Focal-plane shutter with rated speeds of 1/1000 to 1 sec. Synchronized for FP bulbs and electronic flash. Delayed action. Automatic diaphragm which stops down the lens to desired aperture when shutter is tripped. Assortment of interchangeable lenses available. Eye-level prism view-finder and focusing. Quality of lens, variable. Workmanship of the body parts, lens assembly, and mounting varies considerably.

Praktica FX (Distributed by Praktica Co., Inc.) Same as *Astra 35 FX*.

Praktiflex FX (Prakticon Co., Inc.) \$179.50 with *Isco Westagon* f/2 50 mm. coated lens. Made in Eastern (Russian) Zone of Germany. Focal-plane shutter with rated speeds of 1/500 to 1/2 sec. Synchronized for FP flash bulbs and electronic flash. Automatic diaphragm. Waist-level reflex finder, but prismatic finder (available at about \$13 extra) permits use at eye level. Quality of lenses, variable. Construction standards judged not good. Gear cutting and meshing lacked precision.

Rival 35 MX (Distributed by Peerless Camera Stores, Inc., 415 Lexington Ave., New York 17) Same as *Astra 35 FX*.

Care of Window Screens

SCREEN WIRE, especially when of copper or "bronze," often causes ugly dark stains to appear on the exterior wall of the house. These stains are metallic compounds which wash off the wires and settle on the walls below the window. They are often difficult or impossible to remove completely, but sponging with water, then applying a solution of sodium metasilicate (obtainable from chemical supply houses, sometimes through a druggist; about 2 ounces, dissolved in a gallon of water), rubbing lightly with the sponge until the stain disappears, and finally rinsing thoroughly with plain water again will often do the job, particularly on stains from copper screens.

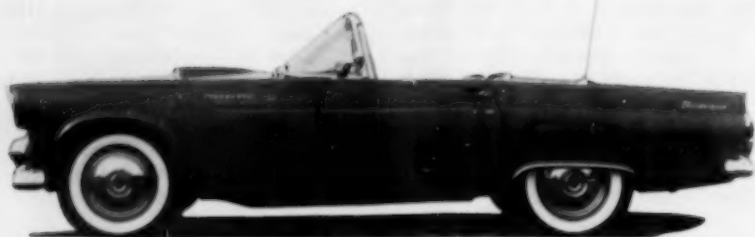
Rust stains from iron screens can be removed from painted walls by sponging with a half cup of ammonia in a quart of water. This should be rinsed off immediately with plenty of water before it has time to injure the paint. It is best to wear rubber gloves in doing this kind of work, with either type of solution.

Preventing the staining is much better than attempting to cure it after stains appear. Most screening is given a coat of lacquer or varnish at the factory which will last through the first season, but after that regular maintenance will be needed. A good coat of spar varnish every year or of screen wire paint every two or three years will serve the dual purposes of prolonging the life of the screening and preventing staining. A more lasting coating for metals exposed to the weather, particularly good on galvanized screening, is paint made with a zinc dust-zinc oxide pigment. This type of paint, while more expensive and not as readily available, may last

much longer than ordinary screen paints and thus be well worth the extra initial outlay. Zinc dust paint is made by a number of paint manufacturers, some of whom are Glidden Co., Cleveland; Pittsburgh Plate Glass Co., Pittsburgh; Socony Paint Products, Metuchen, N.J.; and Sherwin Williams Co., Cleveland.

The paint is normally a gray color, but various colors may be added to give deeper shades. Frequently, zinc dust pigments and a suitable vehicle are packaged separately for mixing on the job. To get uniform proportions, enough paint should be mixed at one time to do the entire job at hand, but it is often good practice to pour a small amount of the well-stirred mixture into a second can so that the brush may be dipped to the bottom of the second can in applying the paint. This tends to keep the paint well mixed so that the zinc dust will be distributed evenly on the screening.

Some preparation of the screening before painting may be necessary, to make the coating last as long as possible. Any grease should be removed by washing with turpentine (fire hazard—no smoking, or flames near by!—inhalation hazard also) or one can use a household synthetic detergent, followed by thorough rinsing and complete drying. Rusty screening should be wire-brushed to remove loose scales. And don't forget that since rain water gets in behind the edge molding, paint should be applied to protect that, too. Carefully pry off all molding and paint the tack heads and edges of the screening as carefully as you do the rest of the screen, if you want to be sure of long-lasting, stain-free screens.



Automobiles— Volkswagen and Thunderbird; New Data on Oldsmobile Super 88



Volkswagen

The phenomenal popularity in this country of the *Volkswagen*, a small car which Hitler once proclaimed every German family would soon be able to own, may well result in American manufacturers revising their opinions as to the acceptability in the United States of a moderate number of small cars. In 1954 about 22 percent of the foreign-make car market was captured by *Volkswagen* and, according to the American distributor, it is now at the top in the foreign car field, selling at the rate of about 2000 per month.

What appeal does this car have that the other small European cars do not have? Many will regard the *Volkswagen* as lacking in attractiveness, for it somewhat resembles an overgrown beetle, and it is not too easy to tell at first glance which is the front and which is the rear. Like most foreign cars, the *Volkswagen* is very well made, and full attention is paid to small details that are often handled carelessly in the domestic product. The chief differences of the *Volkswagen* from other small cars is its use of an air-cooled engine (eliminating the need for anti-freeze in the winter) which is in a compartment at the rear of the car, and its torsion-bar type of suspension, which provides an exceptionally good ride for a car of short wheelbase.

The *Volkswagen*, like the *Austin* and *Morris* and other foreign cars, has a strong appeal to

those who need a "second car," and to those who want a fairly low-priced car economical to operate and easier to park than a standard-size automobile. In spite of its small size, the *Volkswagen* has sufficient room for four adult passengers of normal size, with two comfortable bucket-type seats in front, a seat for two persons in the rear, more headroom than many of the current full-size American cars, fairly adequate luggage space behind the rear seat, and some under the "hood."

A. Recommended

Volkswagen 2-Door Sedan Deluxe (Distributed by World-Wide Automobiles Corp., 302 Fifth Ave., New York 1) \$1520 delivered N.Y.C., with heater.

Considered very suitable for those who need economical transportation without overmuch sacrifice of comfort, or for those who need a "second car" at a moderate price.

CR'S FINDINGS ON ROAD TESTS

Acceleration times (with net load of 492 lb.) from 0 to 30 m.p.h., changing from first to second gear at 15 m.p.h., 8.1 sec.; from 20 to 50 m.p.h., shifting from third to high at 45 m.p.h., 21.4 sec.; from 40 to 60 m.p.h. in fourth gear, 33 sec. (By way of comparison, the *Ford 6* with standard transmission has an acceleration time of 13.4 sec. in the 20 to 50 m.p.h. range.)

Gasoline mileage under test conditions: at constant speed of 30 m.p.h., 46 m.p.g.; at 50 m.p.h., 37 m.p.g. (the *Ford 6* gave 18.7 m.p.g. at 50).

VOLKSWAGEN SPECIFICATIONS

Engine

4 cylinders horizontally opposed
Bore, 3.03 in.; stroke, 2.52 in.
Piston displacement: 79.7 cu. in.
Brake horsepower: 36 at 3700 rpm. (as given by mfr.)
Taxable horsepower: 14.4
Compression ratio: 6.6 to 1
Manual choke
Crankcase oil capacity: 2.7 qt.
Oil filter: none
Cooling system: air cooled

Chassis, etc.

Wheelbase: 94.5 in.
Over-all length: 160 in.
Width: 61 in.
Height: 59 in.
Gear ratio: 4.4 to 1
Engine revolutions per mile: 4380 in third, 2920 in fourth gear
Tires: 5.60 x 15 (5 ply)
Brake area: 90 sq. in.
Brake factor: .45 (good)
Frame: see text
Minimum road clearance: 6-7/8 in.
Turning diameter: 36 ft.
Rear shoulder room: 47.5 in.
Steering factor: 2.2

Other details

Battery: 6-volt 70-amp.-hr.
Gasoline tank: 10.5 gal.
Windshield wipers: electric
Shipping weight: 1565 lb.
Curb weight of car tested: 1630 lb., with 43% on front (very favorable)

Riding comfort was good for a short-wheelbase car, but joints in the concrete roads were quite noticeable in the ride (more so than on cars of normal wheelbase). The car took holes and bumps well because of its good suspension system. Steering was very fast and easy. There was some tendency to oversteer, on the part of persons used to American cars.

Speedometer errors: at indicated speed of 35 m.p.h., actual speed was 33 m.p.h.; at 50 m.p.h., 46.5.

OBSERVATIONS AND CONCLUSIONS

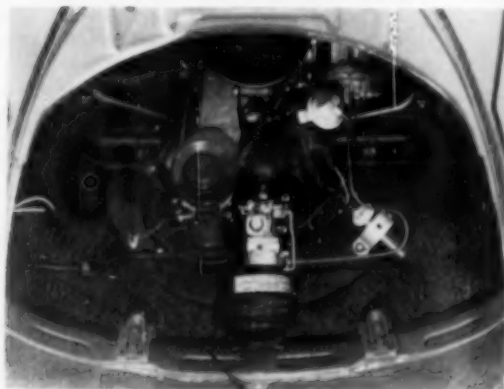
The car is considerably heavier at the rear than at the front, which is very desirable, as it provides better-than-average traction at the rear wheels; this should help with snow and other bad road conditions.

¶The frame consists of a center tunnel to which the steel floor with reinforcing side rails is attached. The tunnel houses the shift linkage and other controls. The transmission has no direct drive. Its ratios are: first speed, 3.6 to 1; second, 1.88 to 1; third, 1.23 to 1; fourth, 0.82 to 1. Piston speed is low even at maximum speed, which is about 68 m.p.h.

¶Warning light signals are used in place of the oil-pressure gauge and ammeter (undesirable). There are also light indicators for headlight beams and turn signals. The latter are not "self-canceling" as they are on most American cars. There is no gasoline gauge, but a fuel valve is located on the fire wall in the front compartment. When the engine begins to miss from lack of gasoline, the valve is turned clockwise, which makes available a reserve of about 1½ gal. of gasoline. (This system has disadvantages, if, for example, the main tank is exhausted at a critical place in traffic or in crossing a railroad track.)

¶A large thermostatically-controlled fan supplies air to the cooling ducts which surround the cylinders. Hot air from the engine cooling ducts is supplied to the car heater and defrosters. The engine was somewhat noisy in the first three gears, but reasonably quiet in fourth gear. (Engine noise was more noticeable to rear-seat passengers than to those in the front seat.) Because of the relatively low horsepower, considerable gear changing is necessary (not too serious a disadvantage, as gear changing is easy and accomplished with little effort). The battery is located under the rear seat.

¶The engine was readily accessible for repairs and a service dealer could remove it as a whole from rear compartment quickly and easily if necessary.



Engine in rear compartment of Volkswagen.



Front compartment of Volkswagen.

¶The only serious shortcoming of this car was found to be the poor rear vision, and, in CR's opinion, the installation of a good outside rear-view mirror would be essential for safety. The instruction manual for this car was unusually complete, well illustrated with specific directions for such items as cleaning carburetor, adjusting contact points, emergency adjustment of brakes when required, etc. American manufacturers, whose so-called instruction books seem to give less and less information for the intelligent and careful driver would do well to copy Volkswagen's policy. A business paper reports that the Volkswagen has a dealer organization of several hundred outlets with good stocks of spare parts.

Ford Thunderbird

This may perhaps be described as a "hybrid" sports car. It is a compromise between a true sports car and a typical convertible or hard top coupé stock car. Performance and roadability approach those of sports cars, whereas in comfort for two persons the car is reasonably near the more usual types of automobiles.

A. Recommended

Ford Thunderbird Hardtop. \$3034 delivered Pa.

Power-actuated seat is standard equipment. *Fordomatic* transmission, \$215; power brakes, \$40; power steering, \$135; heater, \$85; radio, \$89 or \$99.

This car should appeal to those who want a sports-type car that can be serviced conveniently (Ford service agencies are available most anywhere, and many of the mechanical parts are interchangeable with Ford or Mercury parts). Performance was good. Better performance (acceleration) and better fuel economy would be obtained with the over-drive transmission at \$110 extra (3.92 to 1 rear axle ratio).

CR'S FINDINGS ON ROAD TESTS

Equipment on car tested: Standard transmission with 3.73 to 1 rear axle ratio; heater, radio, power brakes, and "power seat."

Acceleration times from 0 to 60 m.p.h. (using first and second gears only, shifting at 4400 rpm. engine speed), 11.6 sec., or about the same as the *Jaguar XK120*; from 20 to 50 m.p.h., 6.4 sec. in second gear, 10.0 sec. in third gear; from 40 to 60 m.p.h., 6.8 sec. in second gear, 7.7 sec. in third gear. Not as



Ford Thunderbird

FORD THUNDERBIRD SPECIFICATIONS

Engine

8 cylinders in "V" arrangement, overhead valves
Bore, 3.75 in.; stroke, 3.30 in.
Piston displacement: 292 cu. in.
Brake horsepower (rated): 193 at 4400 rpm. (198 with *Fordomatic*)
Rated horsepower per 1000 lb. of car weight with 2 passengers: 59
Taxable horsepower: 45
Compression ratio: 8.1 to 1 (8.5 to 1 with *Fordomatic*; requires premium gasoline)
Cylinder head: cast iron
Automatic choke
Crankcase oil capacity: 5 qt.
Oil filter: full-flow type
Cooling system (pressure type): 21 qt. with heater

Chassis, etc.

Wheelbase: 102 in.
Over-all length: 175 in.
Width: 70 in.
Height: 52 in.
Gear ratio: 3.73 to 1 (3.31 to 1 with *Fordomatic*)
Engine revolutions per mile: 2810 (2490 with *Fordomatic*)
Tires: 6.70 x 15 tubeless
Brake area: 175 sq. in., 53 sq. in. per 1000 lb. of car weight with 2 passengers (good)
Frame: "X" member, box section side rails, 4 cross members
Minimum road clearance: 5.9 in. at frame
Turning diameter: 36 ft.
Shoulder room: 53.5 in.
Steering wheel turns, full left to full right: 3

Other details

Battery: 6-volt 90-amp.-hr.
Gasoline tank: 17.5 gal.
Windshield wipers: vacuum type
Shipping weight: 2985 lb.
Curb weight of car tested: 3180 lb., 52% on front (less than average, desirable)

good as the *Mercury Monterey* in the 20 to 50 and 40 to 60 m.p.h. ranges.

Gasoline mileage under test conditions at constant speed on level road at 30 m.p.h., 18.6 m.p.g.; at 50 m.p.h., 15.7 m.p.g. (Not as good as the *Jaguar XK120* and only about half as good as the *Austin-Healy 100* and *Triumph TR-2*.)

Speedometer errors: at indicated speed of 20 m.p.h., actual speed was 19 m.p.h.; at 35 m.p.h., 34; at 50 m.p.h., 45; at 60 m.p.h., 54; at 70 m.p.h., 64. **Odometer** was inaccurate by about 3% (100 miles would be shown as 103 miles).

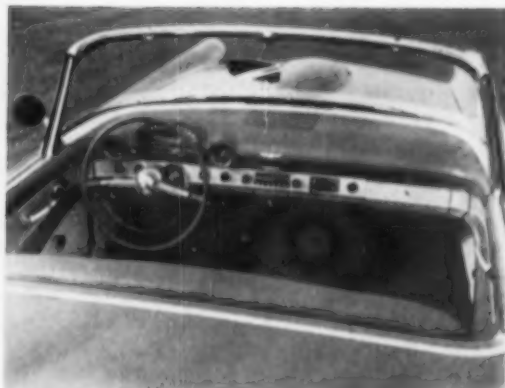
OBSERVATIONS AND CONCLUSIONS

This car, like the sports cars, gave a very "firm" ride, with noticeable road shock at low speeds. At moderate speeds, the ride was hard and choppy, but with no pitching.

¶Steering was precise and fast. Practically no wander was noted on straight roads in spite of strong cross winds. The steering wheel had an adjustment toward and away from the driver of approximately



Trunk of Thunderbird.



Ford Thunderbird

3 in. which, coupled with the 4-way "power seat," provided a very comfortable driving position for most drivers.

¶The seat cushion was placed relatively low with respect to the operating pedals, typical of sports cars. No interference with driver's feet in operating the clutch, brake, and accelerator pedals was noted. However, slightly more floor space to the left of the clutch pedal would permit a more restful position of the left leg on a long trip. Foot space for the passenger side was about as much as afforded by most American cars of the conventional kind.

¶This car was equipped with power brakes. Brake-pedal effort was moderate, but higher than usually expected with a power brake system. The brakes operated smoothly with no side pull. When the engine was switched off, approximately three reserve applications of the brake were available; after that a higher pedal effort was required.

¶Engine noises were moderate (not as low as with the *Jaguar*—reported in December 1954 BULLETIN). With hard top in position and side windows closed, wind noises were low. Visibility forward and to the rear was good. The high carburetor air intake scoop located on the hood was annoying at first, but after the car was driven for a while the high scoop did not appear to be a serious objection.

¶Aside from the location of the tachometer, which was at the extreme left side of the dash, the instrument panel is similar to that of a conventional *Ford* car. Due to the low seating position and the back lighting of the speedometer, with its low-contrast dial, the driver finds trouble in reading this instrument quickly and safely. An instrument panel such as is used on the *Triumph TR-2* and other sports cars would be preferred.

¶The side window cranks are located too far forward and too low on the doors for easy reach, and the crank effort to operate the windows was too great. On the car tested, one of the windows did not fully close. Interior space was adequate for two adults and the car was more roomy than other sports cars tested. Considerable difficulty was experienced by

the driver in entering the car because of the steering wheel's being in the way; with the hard top in place, the upper edge of the window frame made entrance difficult.

¶The removable glass-fiber top gives good all-weather protection, but it takes two persons to remove or replace it. (A convertible top is available instead of the hard top, for \$80 extra, or the convertible top together with the hard top can be obtained for \$295.)

¶The gear noises were fairly high when operating in first and second gear. The shift lever was located on the transmission tunnel. While shifts could be made easily without clashing of gears, considerable play of the lever relative to the gates was noted. However, the travel of the gear shift lever was shorter than on the *Jaguar* tested by CR. Indicating lights were used in place of ammeter and oil pressure gauge (undesirable). Fresh-air intakes at front grille (undesirable). Trunk space was fair for a sports car, but space distribution was poor (spare tire takes up considerable floor space).

Oldsmobile Super 88, new data

A number of subscribers have written to us to raise questions about the acceleration figures we reported for the *Oldsmobile* in the March issue. Some gave acceleration times they observed on their own cars, but neglected to make correction for speedometer errors. These errors can be significant; for example, if a speedometer is as inaccurate as the one on CR's first test car, the acceleration time reported for the 0 to 60 m.p.h. range would actually have been the time for accelerating from 0 to 55 m.p.h., and that in the 40 to 60 m.p.h. would have applied actually to the range of 35 to 55 m.p.h. Thus, using speedometer readings without correction in such a case would result in figures much more favorable to the car's performance, shortening the

time by as much as 2.5 seconds in the 0 to 60 m.p.h. range.

Two methods are commonly used in measuring acceleration from one speed to another. The method used by CR and considered the most informative, as it is a measure of the car's ability to pass another car, is from *constant* speeds of 20 and 40 m.p.h. to 50 and 60 m.p.h., respectively. The question is, if a car is proceeding at a steady speed of 40 m.p.h. and the driver wishes to pass another car in front of him, then presses the accelerator to the floor, how many seconds will be required for the car to reach 60 m.p.h.? In the other method, which is not used by CR, the car is started from rest, the accelerator is pressed to the floor, and the time is measured from the point at which the speedometer reads 40 m.p.h. to that which reads 60 m.p.h. The time required in this case will be less and more favorable to the car than that obtained by the first method.

Other subscribers have pointed out that our figures of time to accelerate were higher (less favorable) than those reported by some of the popular magazines. We have no reason to doubt that the figures given by such magazines are those obtained for the particular cars they tested by the method they use, but the reader is not told whether the cars were representative of the cars of the make such as the consumer would obtain when he makes his purchase from an authorized dealer and has it serviced and tuned by him. If the cars tested are obtained at the factory or under its immediate control and tuned by specially skilled personnel, time for acceleration would normally be considerably reduced below that for a run-of-the-dealer car of the same make. In some cases the popular magazines have reported making their tests at the

factory proving grounds before the cars were available to the general public; we believe that in such cases the performance of the cars will not be representative of the cars in the hands of the consumers who get a run-of-the-mill mass-production product with no special selection or treatment designed to bring out the best it has in it.

In the case of the *Oldsmobile Super 88*, there was some reason to believe that the car CR obtained might not have been as well tuned as would be expected on the average. On this account, another *Super 88* was obtained and tested for acceleration and gasoline mileage. The dealer knew this car was to be tested and, it is to be presumed, gave it a very careful going over before delivery to CR. The results obtained on the two cars appear below.

Acceleration Times in Seconds

	0-30 m.p.h.	0-60 m.p.h.	20-50 m.p.h.	40-60 m.p.h.	m.p.g. at	
					30 m.p.h.	60 m.p.h.
First car	4.3	14.9	8.8	8.4	20.4	16.7
Second car	4.1	12.9	7.7	6.9	20.4	17.8

It will be noted that the second car of the two tested gave somewhat better performance than the first; on the other hand, the differences were not of very great magnitude; they represent about the range of performance that we believe might be expected between two different cars of the same make as they would come into the hands of consumers through an average dealer in the one case, and a dealer doing a careful tuning job in the second case.

Flying Steel Blade Kills Gaston Woman

THE headline above which appeared recently in a North Carolina newspaper refers to an accident that occurred with a lawn mower of the rotary type. It is reproduced to remind owners of such machines of the grave hazards, even to bystanders, that may be involved in use of this type of mower.

The victim was seated on her doorstep when a 3-inch piece of steel was thrown from the blade

of a rotary lawn mower being operated across the street. The flying piece of steel imbedded itself in her brain. The same sort of danger exists even when the mower itself does not fail, as it may kick up from the lawn a piece of metal or a hard stone. In such a case the object would be hurled with a speed which is about one half that of a revolver bullet, and a grave or fatal injury to a person some distance away might be the result.

Road Maps for Tourists

BY PROFESSOR ROBERT M. CRISLER

WITH more and more people traveling about the country by automobile, questions inevitably arise as to the availability and reliability of road maps. It is to the credit of the major oil companies and map makers that there is little cause for concern about this question. There is no need to buy road maps. Gasoline stations willingly give them out even when no purchase is made. It should be pointed out, however, that many so-called "cut-rate" stations, selling brands of gasoline not widely advertised, fail to provide such extra services as free road maps.

Past experience has indicated that gasoline stations directly adjacent to heavily traveled tourist routes may, at the height of the tourist season, be temporarily out of some highway maps which they normally have at other seasons. For this reason, people who are planning trips of some distance may find it expedient to obtain maps at their local home town stations early. Better yet, write direct to one of the tourist service departments that are maintained by many of the major oil companies for suggested routings and information concerning the vacation journey you are planning. Similar service is provided by the state and city subsidiaries of the American Automobile Association for their members. At least one major automobile insurance company provides its membership with a very adequate atlas containing road maps of all the states, Canada, and Mexico.

Road maps and other recreational literature are also available for the asking from most of the individual states, usually from the state highway department. Such maps may excel oil company maps in being up to date and in showing more points of interest. On the other hand, the variety of cartographic methods used by the different states in making these maps may confuse some tourists, in which case they are better off to stick with the familiar oil company maps.

Maps issued by such companies as Cities Service, Conoco, Diamond DX, Esso, Gulf, Mobilgas, Pan-Am, Phillips 66, Sinclair, Skelly, Shell, Standard of Indiana, Sun Oil Co., and Texaco are all essentially reliable. The differences between the best and poorest of maps distributed by such companies are generally relatively unimportant. These maps are made by reliable concerns such as Rand McNally & Co.,

Chicago; H. M. Goush^á Co., Chicago and San Jose; and General Drafting Co., Inc., Convent Station, N. J.

Road maps should show all federal and state numbered highways and whether paved, gravel, or dirt. Towns and cities should be indicated by symbols indicating relative size. Most road maps indicate in addition which are county seats. County boundaries and major streams are generally shown, as well as points of particular interest. Mileage between towns is indicated.

Due to constant improvements on our highways, there is always some lag between completion of new construction and its being shown on road maps. This is unavoidable and not a serious problem as a rule. In using road maps, however, one should keep in mind that the common practice of showing federally numbered highways by red lines does not necessarily mean they are better or shorter than paved state highways commonly shown by blue lines. Tourists are sometimes under the erroneous impression that federally numbered highways are sure to be the better.

One of the common criticisms of oil company road maps is that they show towns which are hardly more than wide places in the road, if distinguishable at all. This criticism warrants continued attention from the makers of road maps. To be shown on a road map, a town should at least have a gasoline station, to be important to consumers. For fear of promoting a competitor's products, oil companies may not think it practical to fill in a blank place on the map with "Joe's Last Chance Oasis," but the railroad sidings that are recorded as flourishing communities are completely unnecessary to the average driver.

Road maps should clearly state whether they were drawn in 1953, 1954, or 1955. Unfortunately not all do. The unsuspecting tourist may on occasion be stuck with an older map. Since good road maps should carry population statistics for cities and towns in an index at the side of the map, one can usually ascertain from this if 1950 census figures were used. The map is obviously outdated if the census of 1940 was used. If symbols used on the map indicating the size category in which a city falls are not accurate, that again is an indication of an older map even if the 1950 census has replaced the

1940 census in the city index. (An occasional error of this sort is sometimes made deliberately to help protect against infringement of copyright.) Blotting out size category symbols to permit indicating locations where a particular brand of gasoline or oil may be obtained is to be considered an undesirable form of advertising.

Considerable improvement could be made by makers of road maps in the selection of points of interest to be featured. There is little purpose in showing caves not open to tourists and omitting some that are. Likewise, if four-year colleges are to be shown as points of interest, it would seem preferable to indicate all of them.

Most road maps indicate the presence of far more tourist attractions than most of us will ever have a chance to see. How about the following as a checklist of some of the more outstanding? This does not provide for individual preferences. Some people like caves or lakes, others national and state parks, and still others cities. Some prefer old homes or historical sights, and some prefer to stick with state capitols. As to cities, about the best way to see the main sights quickly is to abandon the family car temporarily and take a sightseeing bus.

East—Acadia National Park, *Maine*. White Mountains, *N.H.* *Mass.*: Boston; Cape Cod; Plymouth Rock; Old Sturbridge Village. *New York*: New York City; National Baseball Hall of Fame and Museum, Cooperstown; Niagara Falls; Adirondack Mountains. *Atlantic City, N.J.* *Pa.*: Philadelphia; Valley Forge State Park; The Pennsylvania Turnpike; Gettysburg National Military Park. *Washington, D.C.*

South—*Va.*: Arlington Cemetery; Mount Vernon; Williamsburg; Jamestown; Richmond; Monticello; Shenandoah National Park. Great Smoky Mountains National Park, *N.C.-Tenn.* *Charleston, S.C. Fla.*: St. Augustine; Marineland; Silver Springs; Cypress Gardens; Miami; Key West; Everglades National Park. *Nashville and The Hermitage, Tenn. Ky.*: Pioneer Memorial State Park; Kentucky Lake; Mammoth Cave National Park. *Bellingrath Gardens, Ala.* *Natchez, Miss.* *New Orleans, La.* *Avery Island, La.* *Hot Springs National Park, Ark.* *Will Rogers Memorial, Okla.* *Tex.*: Galveston; San Antonio; Big Bend National Park.

Middle West—Henry Ford Museum and Greenfield Village, *Mich.* *Chicago, Ill.* *Wisconsin Dells, Wis.* *Open pit iron mining, Minn.* *Amana, Iowa.* *Hannibal, Mo.* *Big Spring State Park, Mo.*

West—Black Hills, *S.D.* *Badlands National Monument, S.D.* *Glacier National Park, Mont.* *Wyo.*: Yellowstone National Park; Grand Tetons National Park; Devils Tower National Monument. *Colo.*: Rocky Mountain National Park; Mesa Verde National Park; Colorado Springs; Central City; Royal Gorge; U.S. Highway 550 from Montrose to Durango. *Carlsbad Caverns National Park, N.M.* *Sante Fe, N.M.* *Ariz.*: Petrified Forest National Monument; Grand Canyon National Park; Tombstone. *Boulder Dam and Lake Mead, Ariz.-Nev.* *Nev.*: Las Vegas; Reno; Virginia City. *Monument Valley, Utah-Ariz.* *Utah*: Zion National Park; Bryce Canyon National Park; Cedar Breaks National Monument; Great Salt Lake. *Craters of the Moon National Monument, Idaho.* *Grand Coulee Dam, Wash.* *Mt. Rainier National Park, Wash.* *Crater Lake National Park, Oreg.* *Calif.*: Lassen Volcanic National Park; Yosemite National Park; Kings Canyon and Sequoia National Parks; Death Valley National Monument; San Francisco; Los Angeles; Monterey Peninsula.

Corrections and Emendations to Consumers' Research Bulletins

Men's White Dress Shirts
Page 14, Col. 2
Jan. '55 Bulletin
The collar of the *Van Heusen, Century 100*, cotton broadcloth shirt is not a fused collar but a woven collar, made of three plies of cloth combined on the loom. (Fused collars, too, are made of three plies of cloth, but the inner lining is of cellulose acetate which, in manufacture, is softened with solvent and then fused by heat to the collar material.)

Caulking Compounds
Page 30
May '55 Bulletin
The manufacturer of *Vulcatex Elastic Caulking Compound* was incorrectly given as *A. C. Hann Co.* The correct name is *A. C. Horn Co., Inc.*, located at 10 St. and 44 Ave., Long Island City 1, N. Y.

There have been some questions raised about

Carey Caulking Cement. CR can assure subscribers that the product tested bore the name *Carey Caulking Cement, Natural*, and the address was *The Philip Carey Manufacturing Co., Lockland, Cincinnati 15, Ohio.*

Stereo Cameras
Page 211
ACB '54-'55
Revere 33. Change rating from *C. Not Recommended to A-*, to apply to the improved model of the *Revere 33*. Although the latest *Revere* stereo camera is not identified by any change in model number, the defects found in the original sample tested appear to have been corrected by a number of important changes in cameras of current production. A report on this current model of the *Revere 33* camera appeared in the March 1955 issue.

The Regency Transistor Radio

THERE are many new developments in the field of electronics, but comparatively few have found their way into practical and useful applications at the consumer level. Unlike many tubeless pocket radios advertised for years in certain popular magazines, which might work a little if connected to a long wire antenna and used close to a transmitting station, the *Regency* was found to be about on a par in performance, in a number of respects, with two average four-tube portable radios with which it was compared.

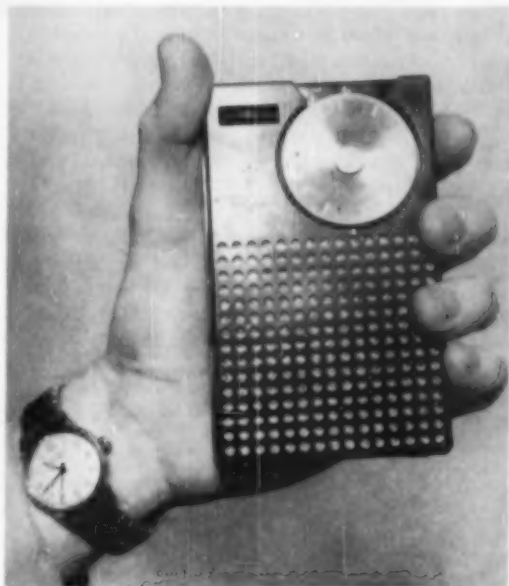
Two recent electronic advancements have been combined to bring to the public a miniature, portable, tubeless radio which really functions. Miniaturization has been achieved in the *Regency* by combining the advantages of printed circuits and the use of four transistors, together with special miniature designs of several circuit components. The *Regency* is still not anywhere near as small in size as Dick Tracy's wrist radio. It will, however, fit in the pocket of a man's sport shirt or jacket. The \$49.95 selling price puts this receiver in the luxury class, since relatively few persons will be willing to expend that amount for qualities—other than novelty and size—available in many other portables at a far smaller cost.

B. Intermediate

Regency, Model TR-1 (Regency Div., I.D.E.A. Inc., 7900 Pendleton Pike, Indianapolis 26) \$49.95, plus \$1.15 for battery. Carrying case, \$4.95 extra.

While novel design, small size, and economy of operation are its principal features, the Regency TR-1 offers satisfactory reception on AM broadcasts, but at low volume of sound output. Better performance than was afforded by the Emerson Pocket Radio (see CR's December 1953 Bulletin).

Case of molded black plastic; over-all size, 3 in. wide, 5 in. high, 1¼ in. deep. Weight with battery, 11 oz. Uses 4 transistors and a crystal detector, instead of vacuum tubes. A single 22½-volt battery, approximately 1⅞ x 1 x ⅝ in., contained within the case, supplies the current needed for operation. The battery, of a type made by several different manufacturers, is priced at \$1.15. Battery life, approximately 30 hr., intermittent use (about 4c per hr.). (The *Regency* is undoubtedly the most economical in battery cost of any battery-operated radio now available, requiring only 3.5 to 5 ma. of current.) Only 2 controls used, combined on-off and volume, and tuning control. The *Regency* was compared with two 4-tube table-model radios, and though the sensitivity or station-getting ability of the *Regency* compared favorably (about 300 microvolts), the background noise, present as a hiss, was much higher for the *Regency* (to be expected since it uses transistors



The Regency Portable Transistor Radio

instead of vacuum tubes). A tone control would likely be helpful since it would tend to reduce the hiss which was at a satisfactorily low level only on strong local stations. The tone quality of the *Regency* was poor by comparison with any reasonably large radio receiver, but one cannot expect good audio quality from any "miniature" receiver using a small 2½-in. speaker with practically no "baffle area." The receiver thus gives thin and weak reproduction and does not reproduce low tones of voice and music. Power output, very low (0.015 watt—0.03 maximum, with high distortion) and adequate only for listening with the receiver rather close to the user (within 20 ft., approximately), on strong local stations. Increasing volume to a satisfactory level resulted in unpleasant distortion. Provision is made for plugging-in a special earphone (non-standard receptacle), available at \$7.50 extra, which would make the *Regency* desirable to those devotees of baseball and football who like to watch one game and at the same time follow another that is being broadcast. It is likely that, if the radio develops trouble, factory service may be required, because of the very compact layout of parts and circuit details. ¶A de luxe version using a similar circuit is also available in cases of several different colors at \$54.95. A vacuum-tube radio would give better tone quality, less background noise, and somewhat easier tuning at a considerably lower price but would be at a disadvantage in size, weight, and battery consumption, compared with the *Regency* (which would warrant an A rating where these three factors are paramount).

A Brushless Auto Enamel

FEW PEOPLE paint their own cars, but anyone whose car paint is in bad condition and who does not wish to pay the price for a professional spray paint job may find the solution to his problem in *Wype* "brushless enamel." The paint is applied to the car with a powder puff after the surface is sanded down and cleaned to remove rust. A one-quart can of paint is claimed to provide two full coats. If the directions are followed and reasonable care is used, a satisfactory job can be obtained—though one that falls short of the work of a professional body-finisher. A curing time of 48 hours is recommended before application of the second coat.

Test panels coated with *Wype* were exposed for over six months to the elements with no

signs of deterioration of the paint. The product appears to be of high quality and well suited for the purpose for which it is offered. (An earlier sample of the same brand was favorably reported in *CONSUMERS' RESEARCH BULLETIN* for November 1947.)

A. Recommended

Wype (The Wype Corp., 2241 Gravois Ave., St. Louis 4) \$3.95 a quart. Available in 10 colors, described by the manufacturer as Brewster (Dark) or Jewel (Light) Green, Washington (Dark) or Monticello (Light) Blue, Gray, Red, Maroon, Black, Sun Beige, and White. The product carries a guarantee covering refund of the purchase price if failure should occur by cracking, peeling, fading, or chipping within two years.

Abridged Cumulative Index of Previous 1955 Consumers' Research Bulletins

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Indicates that listings of names or brands are included.

Ratings of Motion Pictures

THIS section aims to give critical consumers a digest of opinion from a wide range of motion picture reviews, including the motion picture trade press, leading newspapers and magazines—some 19 different periodicals in all. The motion picture ratings which follow thus do not represent the judgment of a single person, but are based on an analysis of critics' reviews.

The sources of the reviews are:

Box Office, Cnr, Daily News (N. Y.), The Exhibitor, The Farm Journal, Films in Review, Harrison's Report, Joint Estimates of Current Motion Pictures, Motion Picture Herald, National Legion of Decency, Newsweek, New York Herald Tribune, New York Times, Parents' Magazine, Release of the D. A. R. Preview Committee, Reviews and Ratings by the Protestant Motion Picture Council, The Tablet, Time, Variety (weekly).

The figures preceding the title of the picture indicate the number of critics whose judgments of its entertainment values warrant a rating of A (recommended), B (intermediate), or C (not recommended).

Audience suitability is indicated by "A" for adults, "Y" for young people (14-18), and "C" for children, at the end of each line.

Descriptive abbreviations are as follows:

adv—adventure
biog—biography
c—in color (Ansco, Eastman, Technicolor, Trucolor, Warner Color, etc.)
car—cartoon
com—comedy
cri—crime and capture of criminals
doc—documentary
dr—drama
fan—fantasy
hist—founded on historical incident
mel—melodrama
mus—musical
mys—mystery
nov—dramatization of a novel
rom—romance
sci—science fiction
soc—social-problem drama
trav—travelogue
war—dealing with the lives of people in wartime
wss—western

A	B	C	
—	5	3	Abbott and Costello Meet the Keystone Kops.....com AY
—	4	3	Abbott and Costello Meet the Mummy.....com AY
—	3	12	Adventures of Hajji Baba, The...adv-c A
—	3	2	Adventures of Sadie, The (British).....com A
—	1	5	Affairs of Messalina, The (Italian).....hist-dr A
—	—	3	African Manhunt.....mel A
—	4	2	Ain't Misbehavin'.....mus-com-c A
—	9	4	Americano, The.....mel A
—	6	2	An Annapolis Story.....war-dr-c AY
—	5	3	An Inspector Calls (British).....mys-mel A
—	3	2	Angela.....mel A
1	1	1	Assignment Children.....doc-c AY
—	12	4	Athena.....mus-com-c AY
—	2	7	Atomic Kid, The.....com A
5	9	2	Bad Day at Black Rock.....soc-dr-c A
—	2	7	Bamboo Prison, The.....war-dr A
1	10	6	Battle Cry.....war-dr-c A
—	7	3	Battle Taxi.....war-mel AY
—	12	2	Beachcomber, The (British).....mel-c A
—	2	8	Bedevilled.....mel-c A
—	6	4	Belles of St. Trinian's, The (British).....com A
—	7	8	Bengal Brigade.....mel-c AY
—	5	8	Big Combo, The.....cri-mel A
—	3	8	Big House, U.S.A.....cri-mel A
—	1	3	Big Tip Off, The.....cri-mel A

A	B	C	
—	9	6	Black Knight, The (British).....adv-c AY
—	2	6	Black 13 (British).....cri-mel A
—	6	8	Black Tuesday.....mel A
—	12	4	Black Widow.....mys-mel A
2	9	4	Blackboard Jungle, The.....soc-dr A
1	6	2	Bob Mathias Story.....biog AY
7	10	1	Bridges at Toko-Ri, The.....war-dr-c A
—	2	6	Bullet for Joey, A.....cri-mel A
—	1	7	Cannibal Attack.....mel-c AY
—	4	4	Canyon Crossroads.....mel AY
—	9	3	Captain Lightfoot.....adv-c A
—	—	3	Carolina Cannonball.....com A
—	6	8	Cattle Queen of Montana.....wes-c AY
—	1	2	Cavalcade of Song (Italian).....mus-dr A
—	3	8	Cell 2455, Death Row.....cri-mel A
—	4	7	Chance Meeting (British).....dr A
1	7	4	Chief Crazy Horse.....mel-c AY
—	1	2	City Stands Trial, A (Italian).....cri-mel A
1	7	2	Conquest of Space.....sci-c A
7	9	1	Country Girl, The.....dr A
—	5	4	Crashout.....mel A
—	1	2	Creature with the Atom Brain.....sci-mel A
—	5	4	Cry Vengeance.....cri-mel A
—	4	2	Cult of the Cobra.....mel A
2	9	1	Daddy Long Legs.....mus-com-c AY
1	5	3	Davy Crockett.....biog-c AY
1	7	2	Day of Triumph.....dr-c A
4	8	6	Deep in My Heart.....mus-biog-c A
3	7	7	Désirée.....hist-dr A
—	—	3	Desperate Women, The.....soc-dr A
—	5	5	Destry.....wes-c A
—	1	8	Devil's Harbor (British).....mel AY
—	1	4	Dial Red O.....cri-mel A
1	11	5	Doctor in the House (British).....com-c A
7	4	3	East of Eden.....dr-c A
—	2	2	Eight O'Clock Walk (British).....cri-mel A
—	5	10	End of the Affair, The (British).....dr A
—	2	8	Escape to Burma.....mel-c A
—	9	2	Eternal Sea, The.....biog AY
—	11	3	Far Country, The.....mel-c A
—	3	2	Far Horizons, The.....mel-c AY
—	2	3	Fast and the Furious, The.....mel A
—	4	3	Five Against the House.....cri-mel A
—	3	2	Five Guns West.....mel-c A
—	2	3	Four Ways Out (Italian).....cri-mel A
—	2	6	Front Page Story (British).....mel AY
—	6	—	Fuss Over Feathers (British).....war-dr AY
—	5	6	Game of Love (French).....dr A
—	3	2	Gangbusters.....cri-mel A
7	3	2	Gate of Hell, The (Japanese).....dr-c A
2	10	4	Glass Slipper, The.....mus-fan-c AY
—	3	9	Good Die Young, The (British).....cri-mel A
—	3	1	Gran Varieta (Italian).....com-c A
—	3	2	Great Adventure, The.....doc AY
—	12	3	Green Fire.....dr-c A
1	7	—	Green Magic.....trav-c A
—	8	4	Green Scarf, The (British).....mys-mel A
—	1	3	Half a Century of Songs (Italian).....mus-dr-c A
—	2	1	Half Way to Hell.....war-doc A
—	4	6	Heart of the Matter, The (British).....dr-c A

A	B	C	
1	7	3	Heartbreak Ridge.....war-dr-c A
1	3	—	Hell's Gate (Japanese).....dr-c A
—	4	6	Hell's Island.....mel-c A
—	4	6	Hell's Outpost.....mel A
—	2	3	High Society.....com AYC
—	1	6	Hiroshima (Japanese).....propaganda-war-dr A
1	7	8	Hit the Deck.....mus-com-c A
1	10	1	Holiday for Henrietta (French).....com A
1	9	1	Hunters of the Deep.....doc-c AYC
—	—	5	I Cover the Underworld.....cri-mel A
—	2	6	Illicit Interlude (Swedish).....dr A
—	3	6	Imposter, The (Japanese).....dr A
—	8	2	Innocents in Paris (British).....com A
5	7	4	Interrupted Melody.....mus-biog-c A
—	8	1	Intruder, The (British).....war-dr A
—	1	2	It Came from Beneath the Sea.....sci AY
—	—	4	Jail Bait.....cri-mel A
—	3	3	Jump Into Hell.....war-dr A
—	1	2	Jungle Gents.....com AYC
—	1	7	Jungle Moon Men.....adv AYC
2	7	6	Jupiter's Darling.....mus-com-c A
—	2	1	Karamoja.....doc-c A
—	1	7	Kiss Me Deadly.....cri-mel A
3	3	—	Lady and the Tramp.....mus-car-c AYC
—	7	7	Land of Fury (British).....dr-c A
—	3	1	Las Vegas Shakedown.....mel A
1	10	4	Last Time I Saw Paris, The.....dr-c A
—	7	1	Life in the Balance, A.....mel A
4	11	2	Long Gray Line, The.....dr-c AYC
1	6	5	Long John Silver.....adv-c A
—	4	5	Looters, The.....cri-mel A
—	2	3	Love in the City (Italian).....dr A
4	7	3	Love Me or Leave Me.....mus-biog-c A
—	4	6	Ma and Pa Kettle at Waikiki.....com AYC
—	1	2	Mad at the World.....soc-dr A
—	5	2	Magnificent Matador, The.....dr-c A
—	3	13	Mambo (Italian).....mus-dr A
6	9	1	Man Called Peter, A.....biog-c AYC
—	3	3	Man from Bitter Ridge, The.....wes-c A
—	12	5	Man Without a Star.....wes-c A
—	8	5	Many Rivers to Cross.....mel-c A
—	1	6	Marauders, The.....mel-c A
5	12	—	Marty.....dr A
—	1	2	Master Plan, The (British).....mys-mel A
—	4	4	Masterpiece of Kansas.....wes-c AYC
2	2	1	Mister Roberts.....war-com-c A
—	2	3	Mille, Gobette (Italian).....com A
—	4	2	Moonfleet.....adv-c A
—	1	5	Murder is My Beat.....cri-mel A
—	2	4	Naked Heart, The (Canadian).....dr A
—	3	10	New Orleans Uncensored.....mel A
—	6	7	New York Confidential.....cri-mel A
2	2	1	Not as a Stranger.....dr A
—	9	1	Operation Manhunt.....mys-mel AYC
1	5	1	Othello.....dr A
—	2	7	Other Woman, The.....mel A
—	—	3	Paid to Kill (British).....mys-mel A
—	4	5	Pirates of Tripoli.....adv-c A
—	4	3	Port of Hell.....mel A
5	8	4	Prince of Players.....biog-c A
2	2	—	Private War of Major Benson, The.....com-c AY
—	5	3	Prize of Gold, A.....war-mel-c A
—	4	10	Prodigal, The.....dr-c A
—	5	—	Purple Mask, The.....adv-c AYC
—	9	5	Purple Plain, The (British).....war-dr-c A
2	5	1	Quest for the Lost City.....doc-c AYC
—	9	9	Racers, The.....mel-c A
—	6	1	Rage at Dawn.....mel-c AYC
—	2	8	Revenge of the Creature.....mel AYC

A	B	C	
—	3	3	Robbers' Roost.....mus-wes-c A
—	11	5	Run for Cover.....mel-c A
—	—	6	Sabaka.....mel-c A
—	5	—	Santa Fe Passage.....wes-c AYC
—	3	3	Sea Chase, The.....war-dr-c A
—	7	—	Seminole Uprising.....mel-c AYC
—	5	5	Seven Angry Men.....hist-dr A
1	4	—	Seven Little Foys.....biog-c A
1	3	1	Seven Year Itch.....com-c A
—	7	3	Shotgun.....wes-c A
—	4	1	Shrike, The.....dr A
1	5	8	Silver Chalice, The.....dr-c A
—	3	—	Simba (India).....dr-c A
1	8	6	Six Bridges to Cross.....cri-mel A
—	8	3	Smoke Signal.....wes-c AYC
—	5	—	Snow Creature.....sci AY
—	10	4	So This Is Paris.....mus-com-c A
—	4	5	Soldier of Fortune.....adv-c A
—	5	—	Son of Sinbad.....fan-c A
—	3	—	Souls in Conflict.....doc-c AY
—	3	—	Square Ring, The (British).....mel A
—	7	2	Strange Lady in Town.....dr-c A
—	9	—	Stranger on Horseback.....mel-c AYC
—	7	3	Stranger's Hand, The (British-Italian).....mys-mel A
4	8	2	Strategic Air Command.....war-dr-c AYC
—	—	4	Sunderin (German).....dr A
—	4	1	Tall Man Riding.....wes-c A
—	1	5	Target Earth.....sci AY
—	1	7	Tarzan's Hidden Jungle.....adv A
—	4	5	Ten Wanted Men.....wes-c A
—	1	3	Tender Hearts.....dr A
—	1	3	That Lady (British).....hist-dr-c A
—	4	5	Theodora, Slave Empress (French-Italian).....hist-dr-c A
5	6	6	There's No Business Like Show Business.....mus-com-c A
—	4	2	They Were So Young.....soc-dr A
1	4	—	This Island Earth.....sci-c AY
—	6	4	Three Cases of Murder (British).....cri-mel A
—	4	12	Three for the Show.....mus-dr-c A
—	3	1	Tiger and the Flame, The (India).....dr-c A
—	12	1	Tight Spot.....cri-dr A
—	4	7	Timberjack.....mus-mel-c AYC
—	7	4	To Paris With Love (British).....com-c A
—	7	4	Tonight's the Night (British).....com-c A
—	2	2	Too Young for Love (Italian).....dr A
—	2	7	Top of the World.....dr A
—	7	12	Track of the Cat.....dr-c A
—	2	5	Treasure of Ruby Hills.....wes AYC
—	5	3	Trouble in Store (British).....com AYC
—	5	7	Trouble in the Glen (British).....com-c AYC
—	1	3	True and the False, The (Swedish).....dr A
7	5	1	20,000 Leagues Under the Sea.....adv-c AYC
—	3	8	Twist of Fate.....mys-mel A
2	12	1	Unchained.....soc-dr A
1	9	6	Underwater!.....mel-c A
—	5	9	Untamed.....mel-c A
1	8	6	Vera Cruz.....mel-c A
1	9	5	Violent Men, The.....mel-c A
—	10	4	Violent Saturday.....mel-c A
1	6	5	Wages of Fear, The (French).....propaganda-dr A
—	2	4	Wayward Wife (Italian).....dr A
1	9	4	West of Zanzibar (British).....mel-c AYC
1	9	2	White Feather.....wes-c A
—	4	5	White Orchid, The.....adv-c A
—	5	9	Women's Prison.....soc-dr A
—	4	5	Wyoming Renegades.....wes-c A
—	—	5	Yellowneck.....war-dr-c A
—	3	1	You Know What Sailors Are (British).....com-c A
1	11	3	Young at Heart.....mus-com-c A
—	1	2	Yukon Vengeance.....mel AYC

The Consumers' Observation Post

(Continued from page 4)

operation with department stores in selling rotisseries. Another manufacturer in the field is Marlun Manufacturing Company. The stepped-up advertising campaign is apparently effective in persuading consumers to try out this type of appliance which some consider more satisfactory for roasting than the kitchen range oven.

* * *

COUPON BOOKS are being promoted in certain sections of the country. The technique involves selling 25 or 30 merchants on the idea of supporting an offer from each, incorporated as a coupon, sold in a small book at a dollar or more per book. The coupon promises the holder free service or service at a reduced rate. The Better Business Bureau points out, however, that there are several objections to this kind of promotion scheme. First, the value claimed for the book is always exaggerated; and second, there are limitations on when the purchaser can use the coupon, or there may be a tie-in requiring that something else be bought to get credit for the coupon. The Wichita, Kansas, Better Business Bureau warns that the businessman who signs up for a coupon promising free service may be swamped by a large number of coupon holders who descend upon him all at once and who may perhaps interfere with his regular cash trade. Considerable ill will results if the coupon holders are not attended to, and he may discover that he would have been wiser to have refrained from participation in the scheme in the first place.

* * *

NEW OR NEWLY TESTED:

Jet Brush Dishwasher (I. J. Moritt Products Co., Chrysler Bldg., N.Y.C.), \$2.98. This device consists of a long plastic tube and base to be filled with liquid detergent released through a circular nylon bristled brush at the top by pushing a button that works a small pump. There is also a plastic scraper below the brush at the end for pots and pans. The device is designed to enable the user to apply detergent to dishes without coming in contact with it. It was found, however, somewhat unwieldy in use because of its length and because it does not "stand up" readily on its base. The brush was not large enough to be as effective as a sponge mop, for example. The bristles of one tuft came out after the device had been in use for less than a month. On the whole, it was not considered nearly so effective a dispenser as Squeeze 'N Wash, which consists of a 6-oz. plastic "squeeze-bottle" fitted with a hollow brush top and which sells for only \$1.

Coming —

CR's big 224-page Annual Bulletin is scheduled for mailing early in September. It represents an extensive summary of previous tests and reports by Consumers' Research on many of the products consumers use every day. Conveniently grouped into sections, it rates over two thousand products by brand name, and is fully indexed for looking up a particular item.

Take the opportunity to order this consumer's handbook of buying at the special combination rate on next page!



Lanolin-Foam Beauty Sponge (Kangaroo Products, Inc., Allendale, N.J.)

One kit consisting of sponge and 8 small cakes of detergent, \$1. This device is a technique for marketing a synthetic detergent in toilet cake form. One of the major problems in manufacturing a syndet bar is reported to be softening or crumbling in use. With this product, a small bar of solid synthetic detergent is slipped into an envelope of cellulose sponge which is moistened like a washcloth and suds are formed by squeezing the sponge. It was found to be simple and effective in use but presented some difficulty in rinsing the detergent from the skin; either a washcloth had to be used for rinsing or the soap had to be removed from the sponge. At its present stage of development, the product is probably to be considered chiefly a novelty, although it might be effective for use by children in hard-water areas.

Minute Mop by Ekco, No. M-45 (Ekco Co., Chicago 39) Sponge replacement head, \$2.50, to be used with self-wringing holder, **Hydro-matic Model No. 400** (\$3.98, complete). Sponge made of DuPont cellulose was well designed to fit into corners and get close to walls. The wringer worked very satisfactorily. Directions call for soaking sponge thoroughly before using and rinsing thoroughly before putting away. The booklet of directions was well printed, and directions were clear and easy to follow. Mop handle could be adjusted to shorter length if desired and had ring at top for hanging in broom closet. On the basis of use tests, **Minute Mop** was judged to be an efficient household tool.

Scadle (American Homecraft Co., 3714 N. Milwaukee Ave., Chicago 41), \$2.98 (from gadget shops and mail-order houses). This gadget is a combination ladle, kitchen scale, and measuring cup, made of aluminum, designed to weigh all ingredients in the ladle automatically by means of a simple spring scale device on the handle. The ladle had a capacity of 1 cupful or 1/2 pound. The advertising was contradictory on this point; one source claimed a weighing limit of 1/2 pound, while another claimed 1/4 pound. The indicator on the scale showed a capacity of 8 ounces, or 1/2 pound. The first **Scadle** purchased was defective in that the indicator scraped on the dial, making the reading inaccurate. The second one did not scrape so badly, but showed a rather large degree of inaccuracy in weighing. The device was easy enough to use for the recipes furnished in a little cook book provided, but appeared to have no special advantage over the customary measuring cup. It was not considered worth the trouble, particularly when the use of a special set of recipes in which ingredients were given by weight was called for. It was judged not to be an all-round practical gadget for the average kitchen.

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Phonograph Records

BY WALTER F. GRUENINGER

Please Note: The first symbol applies to quality of interpretation, the second to fidelity of recording.

Brahms: *Serenade in A Major* (Op. 16). Concertgebouw Orchestra under Zecchi. Epic 3LC 3116. \$3.98. The "Serenade without violins" sounds better here than I have ever heard it before. Credit the performers as well as the recording engineers. Not great music, but mellow and warm. AA AA

Debussy: *Piano Music*. Robert and Gaby Casadesus. 6 sides, Columbia SL 222. \$11.94. Celebrating Mr. Casadesus' 20th concert season in America, Columbia brings out this album of "Images," "Preludes," etc. Fine, cool musicianship. But missing is some of the magic of Gieseking's performance of these pieces. A A

Gluck: *Orpheus and Eurydice—Act II*. NBC Symphony under Toscanini with Merriman, Gibson, etc. RCA Victor LM 1850. \$3.95. These scenes in the kingdom of Hades and in the Elysian fields offer contrasting moods beautifully composed and played. Recording favors the voice. Taken from the broadcast of November 22, 1952. Fine example of Gluck's style which belongs in a basic LP library. AA A

Griffes: *The Pleasure Dome of Kubla Khan, White Peacock, etc.* & **Loeffler:** *Memories of My Childhood and Poem for Orchestra*. Eastman-Rochester Symphony Orchestra under Hanson. Mercury MG 40012. \$3.98. Griffes and Loeffler have become "standard" modern American composers and the works played are colorful, melodic, enjoyable. Beautifully performed. Clear, wide-range sound. AA AA

Handel: *The Water Music*. Boyd Neel conducting the Boyd Neel Orchestra. London LL 1128. \$3.98. Rich, robust music that belongs in the basic LP collection. Played here by a chamber orchestra, the melodic strands stand out clearly, but I feel the need of more strings as a contrast to the brass and woodwinds. Good as this is, I prefer the larger scale performance of the Berlin Philharmonic on Decca DL 9594. A A

Mahler: *Symphony No. 9* & **Schonberg:** *Verklärte Nacht*. Israel Philharmonic Orchestra under Kletzki. 4 sides, Angel 3526-B. \$7.98. Very likely Mahler's best work for orchestra. No serious competition in the catalogue. Schonberg is remarkably well played. A AA

Mozart: *Piano Concerto No. 14* & **Strauss:** *Burlesque*. Gulda (piano) with the London Symphony Orchestra under Collins. London LL 1158. \$3.98. Piano a bit to close to the mike, for best balance. But in other respects the sound is commendable. I have heard the third movement of the Mozart played with more bounce, but the Brahmsian, rippling Strauss is first rate. A A

Puccini: *Manon Lescaut*. Tebaldi, del Monaco, etc., under Molinari Pradelli. 6 sides, London LLA 28. \$14.94. Puccini's third opera sets the pattern of the masterpieces to come but its biggest asset is its charm and grace. Excellent direction and recording. Overall, slightly superior to Cetra C 1243. A A

Rossini: *La Cenerentola*. Glyndebourne Festival Group under Gui. 4 sides, RCA LHMV 600. \$9.98. A delightful opera, somewhat cut here, based on the story of Cinderella, which is returning to favor. But it does not rival *The Barber*. The cast is well disciplined, but falls short of ideal. The difficult coloratura role of Cenerentola is sung by Marina de Gabarain whose voice lacks the required flexibility. Others are adequate with Ian Wallace as Don Magnifico best. Excellent recording. B AA

Scarlatti, D.: *60 Sonatas*. Kirkpatrick (harpsichord). 8 sides, Columbia SL 221. \$15.92. Chosen from over 500 to present "a balanced selection of sonatas from each of the principal periods of Scarlatti's mature harpsichord style." No museum pieces, these brief works. Brilliant

writing that thoroughly entertains when heard a few at a sitting. Obviously Kirkpatrick has studied them well and his technique is up to the exacting demands of the music. Excellent recording. AA AA

Sinding: *Suite & Ravel: Tzigane*. Heifetz with the Los Angeles Philharmonic under Wallenstein & **Tchaikovsky:** *Concerto for Violin*. Heifetz with the Philharmonia under Süsskind. RCA Victor LM 1832. \$3.98. Best performed is the melodic Sinding which Heifetz plays as though he loves it. A A

Strauss: *One Night in Venice*. Gedda, Kunz, Schwarzkopf, etc., under Ackermann. 4 sides, Angel 3530-B. \$7.98. If not the greatest Johann Strauss operetta, it is one that keeps a high level of rich, noble, lilting tunes. Magnificent cast, excellent direction. Some German dialogue between songs promotes the action but delays the music. Marvelous recording. AA AA

Strauss Waltzes. Kostelanetz and His Orchestra. Columbia ML 4993. \$3.98. "Blue Danube," "Tales from the Vienna Woods," "Emperor Waltz," etc., abbreviated and orchestrated to suit Kostelanetz. The beat is firm with a few special *ritards* and *accelerandos*, as the conductor desires. But not superbly musical. For that quality, turn to *Musik of Johann and Joseph Strauss* played by the Vienna Philharmonic under Krauss on London LL 1028/29 which is no less well recorded. B A

Suppé: *Light Cavalry Overture and The Beautiful Galathea Overture*. L'Orchestre Symphonique de las Radiodiffusion Nationale Belge. Telefunken TM 68018. \$2.98. Popular light overtures played with appropriate zest and finesse and recorded with wide range. AA AA

Tchaikovsky: *Symphony No. 6*. Philharmonic-Symphony Orchestra of N. Y. under Rodzinski. Col. RL 3118. \$2.98. The original recording appeared on 78's but it is amazing how the engineers have improved matters in the transfer to LP's. This was always one of Rodzinski's calmer, better performances and the budget-minded may find it well worth purchasing. But my choice record of this work is Columbia 4ML 4544 with Ormandy. A B

Elizabethan and Jacobean Music. Deller (counter-tenor) and instrumentalists. Bach Guild BG 539. \$4.98. Short pieces by Dowland, Morley, Bartlett, Jenkins, etc., in which a vocal selection is alternated with an instrumental selection. Of its kind, outstanding. AA AA

Homage to Fritz Kreisler. Campoli (violin). London LL 1171. \$3.95. The great violinist, Kreisler, 80 in February, has retired. Campoli hit on a clever idea in playing 13 charming numbers composed or arranged by Kreisler, but the élan of the master is absent. B A

Lombardland USA. Guy Lombardo and His Royal Canadians. Decca DL 8097. \$3.98. Straightforward dance music, with vocals. Twelve familiar tunes including "Deep in the Heart of Texas," "St. Louis Blues," "Chicago," "Way Down Yonder in New Orleans." Big recording. AA AA

Love at First Sight. Casanova and His Orchestra. Vox VX 760. \$4.75. Strict tempo performance without fussy orchestrations of eight fine tunes—"Night and Day," "Smoke Gets in Your Eyes," "So in Love," etc. No vocals. Good background music. AA AA

Music from Disneyland. Jack Pleis and His Orchestra and Chorus. Decca DL 8105. \$3.98. Hit tunes from Disney films recall enjoyable evenings of years past for many and even when heard critically they still sound good. Included are "When You Wish Upon a Star," "Heigh Ho," "Who's Afraid of the Big Bad Wolf." Very well played and recorded. AA AA



COMING

in Consumers' Research Bulletin

Indoor Television Antennas

JFD Star

RMS KV-3

Snyder 3-D

Snyder 5-D

TENtenna

Magne-tenna

Walsco Star

Sewing Machines

Gas and Electric Clothes Dryers

Automatic Washing Machines